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February 5, 2014

Mr. Kenneth Bardo - LU-9J U.S. EPA Region V Corrective Action Section 77 West Jackson Boulevard Chicago, IL 60604-3507

Re:

Long-Term Monitoring Program 4<sup>th</sup> Quarter 2013 Data Report

Solutia Inc., W. G. Krummrich Plant, Sauget, IL

Dear Mr. Bardo:

Enclosed please find the Long-Term Monitoring Program 4<sup>th</sup> Quarter 2013 Data Report for Solutia Inc.'s W. G. Krummrich Plant, Sauget, IL. Results from supplemental piezometers GWE-3D, 5S, and 5M and wells GWE-5D and ESL-MW-A, C1, and D1 are included in this report. The scope of monitoring after the February 2014 event will depend on US EPA's response to the "2014 Periodic Technical Review (Evaluation of 3Q08 - 3Q13 Data)" that Solutia submitted on January 13, 2014.

If you have any questions or comments regarding this report, please contact me at (314) 674-3312 or gmrina@eastman.com

Sincerely,

Gerald M. Rinaldi

Manager, Remediation Services

Luld Mr. Rille

Enclosure

cc: Distribution List

### **DISTRIBUTION LIST**

Long-Term Monitoring Program 4<sup>th</sup> Quarter 2013 Data Report Solutia Inc., W. G. Krummrich Plant, Sauget, IL

## **USEPA**

Stephanie Linebaugh USEPA Region 5 - SR6J, 77 West Jackson Boulevard, Chicago, IL 60604

## Solutia

Donn Haines

500 Monsanto Avenue, Sauget, IL 62206-1198

4 TH QUARTER 2013 DATA REPORT

# LONG-TERM MONITORING PROGRAM

SOLUTIA INC. W.G. KRUMMRICH FACILITY SAUGET, ILLINOIS

Prepared for
Solutia Inc.
575 Maryville Centre Drive
St. Louis, Missouri 63141

January 2014



URS Corporation 1001 Highland Plaza Drive West Suite 300 St. Louis, MO 63110 (314) 429-0100 Project: 21562962.00001

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### 1.0 INTRODUCTION

This report presents the results of the 4<sup>th</sup> Quarter 2013 (4Q13) sampling event performed at the Solutia Inc. (Solutia) W.G. Krummrich (WGK) Facility located in Sauget, Illinois (Site). This sampling event was conducted in accordance with the Revised Long-Term Monitoring Program (LTMP) Work Plan (Solutia 2009). The Site location is presented in **Figure 1**.

The LTMP was designed to evaluate the effectiveness of monitored natural attenuation (MNA), including: 1) a clear and meaningful trend of decreasing contaminant mass; 2) data that indirectly demonstrate the types and rates of natural attenuation processes active at the site; and 3) data that directly demonstrate the occurrence of biodegradation processes at the site.

Groundwater Sampling Location and Frequency – As specified in the Revised LTMP Work Plan, groundwater samples were collected from five monitoring wells downgradient of the Former Chlorobenzene Process Area (CPA-MW-1D through CPA-MW-5D) and five monitoring wells downgradient of the Former Benzene Storage Area (BSA-MW-1S and BSA-MW-2D through BSA-MW-5D) to assess attenuation processes in the American Bottoms aquifer, as impacted groundwater from these source areas migrates toward and discharges to the Mississippi River. Additionally, at the request of USEPA, Groundwater samples were also collected from monitoring well GWE-5D and piezometers GWE-3D, GWE-5S, and GWE-5M along with East St. Louis (ESL) monitoring wells ESL-MW-A, ESL-MW-C1, and ESL-MW-D1, all located approximately 1.0 - 1.5 miles north of WGK.

Monitoring wells CPA-MW-1D, 2D, 3D, 4D and 5D are located within the limiting flow lines downgradient of the Former Chlorobenzene Process Area. Monitoring wells BSA-MW-1S, 2D, 3D, 4D and 5D are located within the limiting flow lines downgradient of the Former Benzene Storage Area. Source areas and monitoring well locations are presented in **Figure 2**.

**Groundwater Sampling Parameters** – During the 4Q13 groundwater sampling event, groundwater samples from the seventeen monitoring wells described above were analyzed (via USEPA Method 8260B) for benzene, chlorobenzene, 1,2-dichlorobenzene, 1,3-dichlorobenzene, and 1,4-dichlorobenzene to demonstrate a trend of decreasing contaminant mass and/or concentrations over time. In accordance with USEPA comments regarding the Long-Term Monitoring Plan, the following constituents are included in the groundwater monitoring parameter list on a semi-annual basis (1<sup>st</sup> and 3<sup>rd</sup> Quarters):

- 4-Chloroaniline: CPA-MW-3D, CPA-MW-4D and CPA-MW-5D
- 2-Chlorophenol: All BSA and CPA series wells
- 1, 2, 4-Trichlorobenzene: All BSA and CPA series wells
- 1,4-Dioxane: BSA-MW-2D, BSA-MW-3D, BSA-MW-4D and BSA-MW-5D

Samples for analysis of MNA parameters were collected from seventeen monitoring wells. Evaluation of the types of active natural attenuation processes at the site is based on the following key geochemical parameters:

Electron Donors: Organic Carbon (Total and Dissolved)

Electron Acceptors: Iron (Total and Dissolved)

Manganese (Total and Dissolved)

**Nitrate** 

Sulfate

Biodegradation Byproducts: Carbon Dioxide

Chloride

Methane

Biodegradation Indicators: Alkalinity

Direct demonstration of the occurrence of biodegradation processes is completed quarterly utilizing Microbial Insights (<a href="www.microbe.com">www.microbe.com</a>) Bio-Trap® samplers for Phospholipid Fatty Acid (PLFA) Analysis, along with Bio-Trap® samplers baited with benzene or chlorobenzene for Stable Isotope Probing (SIP) analysis.

### 2.0 FIELD PROCEDURES

URS Corporation (URS) conducted 4Q13 LTMP field activities on October 30-31 and November 4-8, 2013. Activities were completed in accordance with procedures outlined in the Revised LTMP Work Plan, including the collection of appropriate quality assurance and quality control (QA/QC) samples. The following section summarizes field investigative procedures:

**Groundwater Level Measurements** – URS personnel used an electronic oil/water interface probe to measure depth to static groundwater levels and the thickness of non-aqueous phase liquid if (NAPL) if present. Depth to groundwater measurements were collected on October 30 and 31, 2013 from accessible existing wells (i.e., BSA-, CPA-, ESL- GM-, GWE-, K-, PS-MW-, and PMA-series) and piezometer clusters (installed for the Sauget Area 2 RI/FS and WGK CA-750 Environmental Indicator projects) specified in the Revised LTMP Work Plan (**Figure 3**). NAPL was not detected within any of the monitoring wells or piezometers gauged in 4Q13.

Well gauging information for the 4Q13 event is presented in **Table 1**. As the middle and deep hydrogeologic units are the primary migration pathway for constituents present in groundwater at the WGK Facility, a groundwater potentiometric surface map based on water level data from wells screened in the Middle Hydrogeologic Unit (MHU) and Deep Hydrogeologic Unit (DHU) is presented as **Figure 3**.

**Groundwater Sampling** - Low-flow sampling techniques were used for groundwater sample collection. At each monitoring well, disposable, low-density polyethylene tubing was attached to a submersible pump or peristaltic pump (GWE-3D), which was then lowered into the well to the middle of the screened interval. Monitoring wells were purged at a rate of approximately 200 to 400 mL/minute to minimize drawdown. If significant drawdown occurred, flow rates were reduced.

Drawdown was measured periodically throughout purging to ensure that it did not exceed 25% of the distance between the pump intake and the top of the screen. Once the flow rate and drawdown were stable, field measurements were collected approximately every two to four minutes. Purging of a well was considered complete when the following water quality parameters remained stable over three consecutive flow-through cell volumes:

Parameter	Stabilization Guidelines
Dissolved Oxygen (DO)	+/- 10% or +/-0.2 mg/L, whichever is greatest
Oxidation-Reduction Potential (ORP)	+/- 20 mV
рН	+/- 0.2 units
Specific Conductivity	+/- 3%

Sampling commenced upon completion of purging. Prior to sample collection, the flow-through cell was bypassed to allow for collection of uncompromised groundwater. Samples were collected at a flow rate less than or equal to the rate at which stabilization was achieved. Sample containers were filled based on laboratory analysis to be performed, in the following order:

- Volatile Organic Compounds (VOCs)
- Gas Sensitive Parameters (e.g., methane, carbon dioxide)
- General Chemistry (e.g., alkalinity, chloride, total and dissolved iron, total and dissolved manganese, nitrate, sulfate, total and dissolved organic carbon, and ferrous iron)

Samples collected for ferrous iron, dissolved iron, dissolved manganese, and dissolved organic carbon analysis were filtered in the field using in-line 0.2 micron disposable filters, represented by a notation of "F (0.2)" in the sample nomenclature.

Quality assurance/quality control (QA/QC) samples consisting of analytical duplicates (AD) and equipment blanks (EB) were collected at a rate of 10% and matrix spike/matrix spike duplicates (MS/MSD) were collected at a rate of 5%. In addition, trip blanks accompanied each shipment containing samples for VOC analysis.

Each investigative or QA/QC sample was labeled immediately following collection. Each sample identification number consisted of the following nomenclature "AAA-MW#-MMYY-QAC" where:

- "AAA" denotes "Benzene Storage Area (BSA)", "Chlorobenzene Process Area (CPA)", "East St. Louis (ESL)", or "Groundwater Evaluation (GWE)" and "MW-#" denotes "Monitoring Well Number":
- "MMYY" Month and year of sampling quarter, e.g.: November (4th quarter), 2013 (1113)
- "QAC" denotes QA/QC sample
  - o AD Analytical Duplicate
  - o **EB** Equipment Blank
  - MS or MSD Matrix Spike or Matrix Spike Duplicate

Upon collection and labeling, sample containers were immediately placed inside an iced cooler, packed in such a way as to help prevent breakage and maintain inside temperature at or below approximately 4°C. Field personnel recorded the project identification and number, sample description/location, required analysis, date and time of sample collection, type and matrix of sample, number of sample containers, preservative used (if applicable), analysis requested/comments, and sampler signature/date/time, with permanent ink on a chain-of-custody (COC). Coolers were sealed between the lid and sides with a custody seal, and then shipped to TestAmerica in Savannah, Georgia by means of an overnight delivery service. Sampling data forms are included in **Appendix A**, while copies of COCs are included in **Appendix B**.

Field personnel and equipment were decontaminated according to procedures specified in the Revised LTMP Work Plan to ensure the health and safety of those present, maintain sample integrity, and minimize movement of contamination between the work area and off-site locations. Equipment used on-site was decontaminated prior to beginning work, between sampling locations and/or uses, and prior to demobilizing from the site. Non-disposable purging and sampling equipment was decontaminated between each sample acquisition by washing with an Alconox® or equivalent detergent wash, a potable water rinse, and a distilled water rinse. Personnel and small equipment decontamination was performed at the sample locations. Disposable sampling equipment, such as gloves were collected and bagged on a daily basis and managed in accordance with Solutia procedures. Purge water was containerized and handled per Solutia procedures.

**Biodegradation Evaluation Sampling** - Bio-Trap<sup>®</sup> samplers and Bio-Trap<sup>®</sup> samplers baited with benzene or chlorobenzene, provided by Microbial Insights, Inc. (Rockford, TN), were

utilized in the LTMP wells (except GWE-5 cluster, ESL wells, and GWE-3D) to provide information regarding biodegradation potential of the Shallow Hydrogeologic Unit (SHU), the MHU and the DHU. Bio-Trap<sup>®</sup> samplers are passive sampling tools which, over time, collect microbes across a membrane that serves as the sampling matrix. When baited with <sup>13</sup>C labeled benzene or chlorobenzene, the Bio-Traps<sup>®</sup> can also be used to measure the degradation of benzene or chlorobenzene utilizing a method also known as stable isotope probing (SIP).

On September 30, 2013, URS field personnel deployed Bio-Trap<sup>®</sup> samplers in each of the LTMP wells (except GWE-5 cluster, ESL wells, and GWE-3D) for PLFA analysis. A benzene baited Bio-Trap<sup>®</sup> and a chlorobenzene baited Bio-Trap<sup>®</sup> were placed in monitoring wells BSA-MW-2D and CPA-MW-3D, respectively. Bio-Trap<sup>®</sup> samplers were attached to a stainless steel line secured to the well cap and lowered to the middle of the well screen.

On October 30, 2013, the Bio-Trap<sup>®</sup> samplers were retrieved from the wells, sealed in laboratory supplied bags, labeled with the proper well identification and placed in an iced sample cooler with a signed COC. Sealed sample coolers were sent to Microbial Insights, Inc. for analysis.

### 3.0 LABORATORY PROCEDURES

Samples were analyzed by TestAmerica for VOCs and MNA parameters, using the following methodologies:

- VOCs, via USEPA SW-846 Method 8260B
- MNA parameters: alkalinity (310.1), carbon dioxide (310.1), chloride (325.2), total and dissolved iron (6010C), total and dissolved manganese (6010B), dissolved gases (RSK 175), nitrate (353.2), sulfate (375.4), and total and dissolved organic carbon (415.1).

Laboratory results were provided in electronic and hard copy formats.

### 4.0 QUALITY ASSURANCE

Analytical data were reviewed for quality and completeness, as described in the Revised Long Term Monitoring Program (LTMP) Work Plan (Solutia 2009). Data qualifiers were added, as appropriate, and are included in the data tables and the laboratory result pages. The Quality Assurance report is included as **Appendix C**. The laboratory reports and data reviews are included in **Appendix D**.

A total of twenty-one groundwater samples (seventeen investigative samples, two field duplicate pairs, and one MS/MSD pair) were prepared and analyzed by TestAmerica Laboratories, Inc. of Savannah, Georgia for combinations of VOCs, dissolved gases, metals, and general chemistry. Additionally, two equipment blanks were prepared and analyzed by TestAmerica. Five trip blanks were included in coolers that contained VOC samples and were analyzed for VOCs. The results for the various analyses were submitted as sample delivery groups (SDGs) KPS097,

KPS098, KPS099, KPS100, and KPS101. The samples contained in these SDGs are listed below:

KP	S097							
BSA-MW-4D-1113	CPA-MW-5D-1113							
BSA-MW-5D-1113	4Q13 LTM Trip Blank #1							
CPA-MW-4D-1113								
KPS098								
BSA-MW-1S-1113	CPA-MW-2D-1113							
BSA-MW-3D-1113	CPA-MW-2D-1113-AD							
CPA-MW-1D-1113	4Q13 LTM Trip Blank #2							
CPA-MW-1D-1113-EB								
KP	S099							
BSA-MW-2D-1113	CPA-MW-3D-1113-AD							
BSA-MW-2D-EB	4Q13 LTM Trip Blank #3							
CPA-MW-3D-1113								
KP	S100							
GWE-3D-1113	GWE-5D-1113							
GWE-5S-1113	4Q13 LTM Trip Blank #4							
GWE-5M-1113								
KP	S101							
ESL-MW-A-1113	ESL-MW-D1-1113							
ESL-MW-C1-1113	4Q13 LTM Trip Blank #5							

Evaluation of the groundwater analytical data followed procedures outlined in the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (USEPA 2008), USEPA Contract Laboratory Program National Functional Guidelines for Superfund Inorganic Data Review (USEPA 2010), and the Revised Long-Term Monitoring Program (LTMP) Work Plan (Solutia 2009).

Based on the above mentioned criteria, groundwater results reported for the analyses performed were accepted for their intended use. Acceptable levels of accuracy, precision, and representativeness (based on MS/MSD, LCS, surrogate compounds and field duplicate results) were achieved for this data set, except where noted in this report. Completeness, which is defined to be the percentage of analytical results which are judged to be valid, including estimated detect/non-detect (**J/UJ**) data, was 100% percent.

### 5.0 OBSERVATIONS

Groundwater analytical detections and MNA results for the 4Q13 LTMP sampling event are presented in **Tables 2** and **3**, respectively. Benzene and chlorobenzenes were reported in samples collected from the LTMP wells during this sampling event. Each of these constituents is discussed below:

**Benzene** – Benzene was detected in samples collected from fifteen of the seventeen wells, at concentrations ranging from 1.5  $\mu$ g/L (ESL-MW-C1) to 920,000  $\mu$ g/L (BSA-MW-1S).

Downgradient of the Former Benzene Storage Area, benzene was detected in the DHU at a concentration of 100,000  $\mu$ g/L (BSA-MW-2D) and at an estimated concentration of 90  $\mu$ g/L (BSA-MW-3D). Near the river north of the Groundwater Migration Control System (GMCS), benzene was detected in the DHU at a concentration of 130  $\mu$ g/L (BSA-MW-4D).

Benzene was detected at the Former Chlorobenzene Process Area (CPA) at a concentration of 9,300  $\mu$ g/L (CPA-MW-1D). Downgradient of the Former Chlorobenzene Process Area, benzene was detected at concentrations of 47  $\mu$ g/L (CPA-MW-4D), 3,800/3,700  $\mu$ g/L (CPA-MW-3D and duplicate), and 610/640  $\mu$ g/L (CPA-MW-2D and duplicate).

Benzene was not detected near the river north of GMCS at monitoring wells CPA-MW-5D or BSA-MW-5D.

Benzene was detected approximately one mile north of the Solutia WGK Facility at concentrations of 8.3  $\mu$ g/L (ESL-MW-A), 1.5  $\mu$ g/L (ESL-MW-C1), 45  $\mu$ g/L (ESL-MW-D1), 36  $\mu$ g/L (GWE-3D), 7.8  $\mu$ g/L (GWE-5S), 5  $\mu$ g/L (GWE-5M), and 9.6  $\mu$ g/L (GWE-5D).

**Chlorobenzenes (Total)** – Total chlorobenzenes (i.e., sum of chlorobenzene, 1,2-dichlorobenzene, 1,3-dichlorobenzene, and 1,4, dichlorobenzene) were detected in thirteen of the seventeen wells sampled in 4Q13, at concentrations ranging from 1.4  $\mu$ g/L (ESL-MW-C1) to 60,900  $\mu$ g/L (CPA-MW-1D).

Downgradient of the Former Chlorobenzene Process Area, total chlorobenzenes were detected in the DHU at concentrations of  $48,140/47,230~\mu g/L$  at the North Tank Farm (CPA-MW-2D and duplicate), along with concentrations of  $290/300~\mu g/L$  (CPA-MW-3D and duplicate) and  $259.3~\mu g/L$  (CPA-MW-4D). Total chlorobenzenes were detected in the DHU near the river north of the GMCS at a concentration of  $1,900~\mu g/L$  (CPA-MW-5D).

Downgradient of the Former Benzene Storage Area, total chlorobenzenes were detected at a concentration of 2,750  $\mu$ g/L (BSA-MW-3D). North of the SA2 GMCS, near the river, total chlorobenzenes were detected in the DHU at concentrations of 2,571  $\mu$ g/L (BSA-MW-4D) and 440  $\mu$ g/L (BSA-MW-5D).

Total chlorobenzenes were detected approximately one mile north of the Solutia WGK Facility at concentrations of 6.8  $\mu$ g/L (ESL-MW-A), 1.4  $\mu$ g/L (ESL-MW-C1), 1,541  $\mu$ g/L (ESL-MW-D1), 2,085  $\mu$ g/L (GWE-3D), and 182.2  $\mu$ g/L (GWE-5D). Total chlorobenzenes were not detected at GWE-5S or GWE-5M.

Figure 4 displays benzene and total chlorobenzenes results from the 4Q13 sampling event.

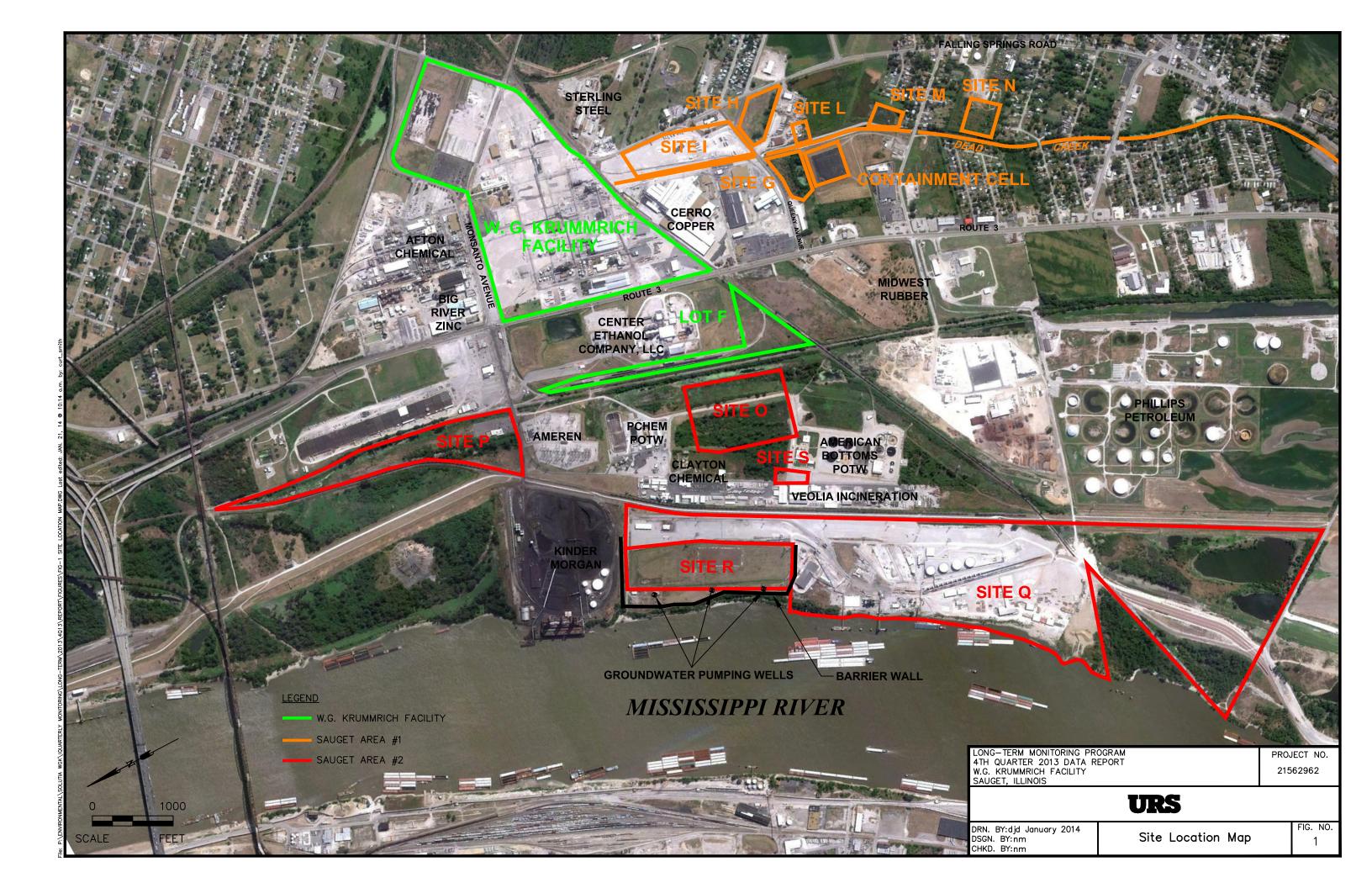
**Monitored Natural Attenuation** – The MNA results for this quarter are presented in **Table 3**. PLFA and SIP laboratory results are included in **Appendix E**. Per the Executive Summary of

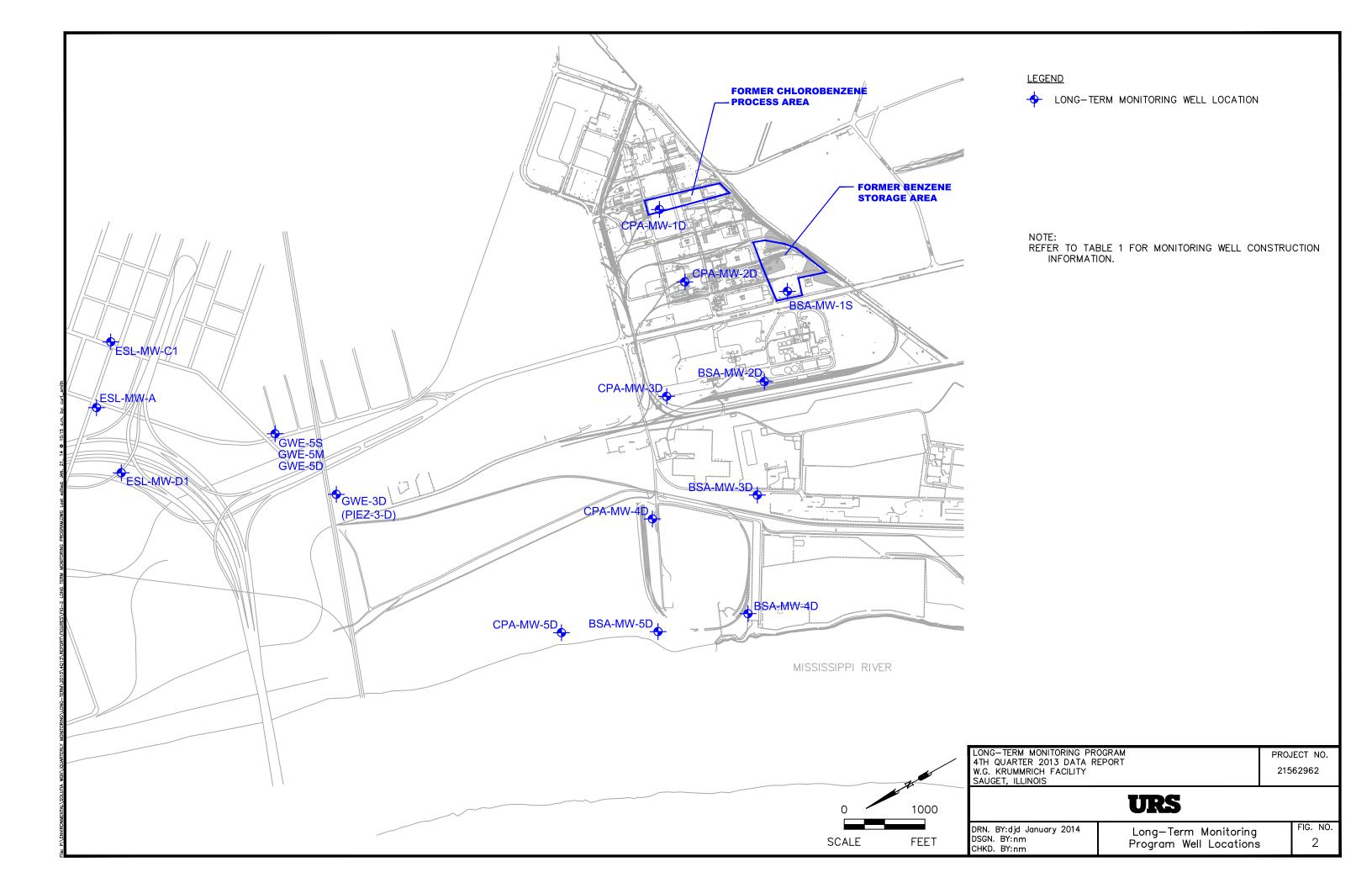
the SIP Study (**Appendix E**): "Incorporation of <sup>13</sup>C [carbon-13] into the biomass in wells BSA-MW-2D-1113 and CPA-MW-3D-1113 conclusively demonstrates that benzene and chlorobenzene biodegradation occurred under existing site conditions". Elevated levels of carbon dioxide and methane, which are biodegradation byproducts, in a majority of the LTM wells provide further evidence to support the occurrence of natural attenuation.

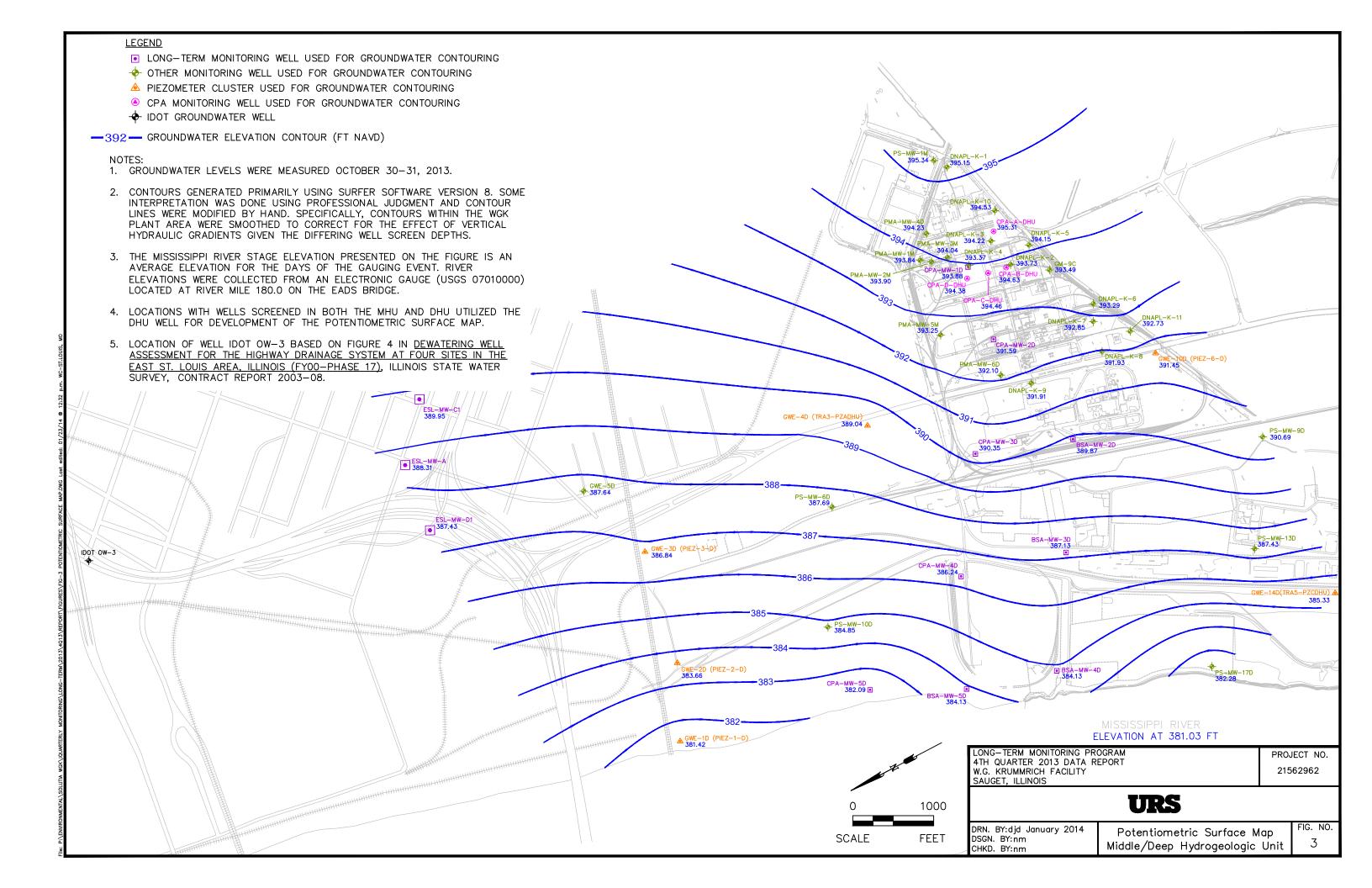
### 6.0 REFERENCES

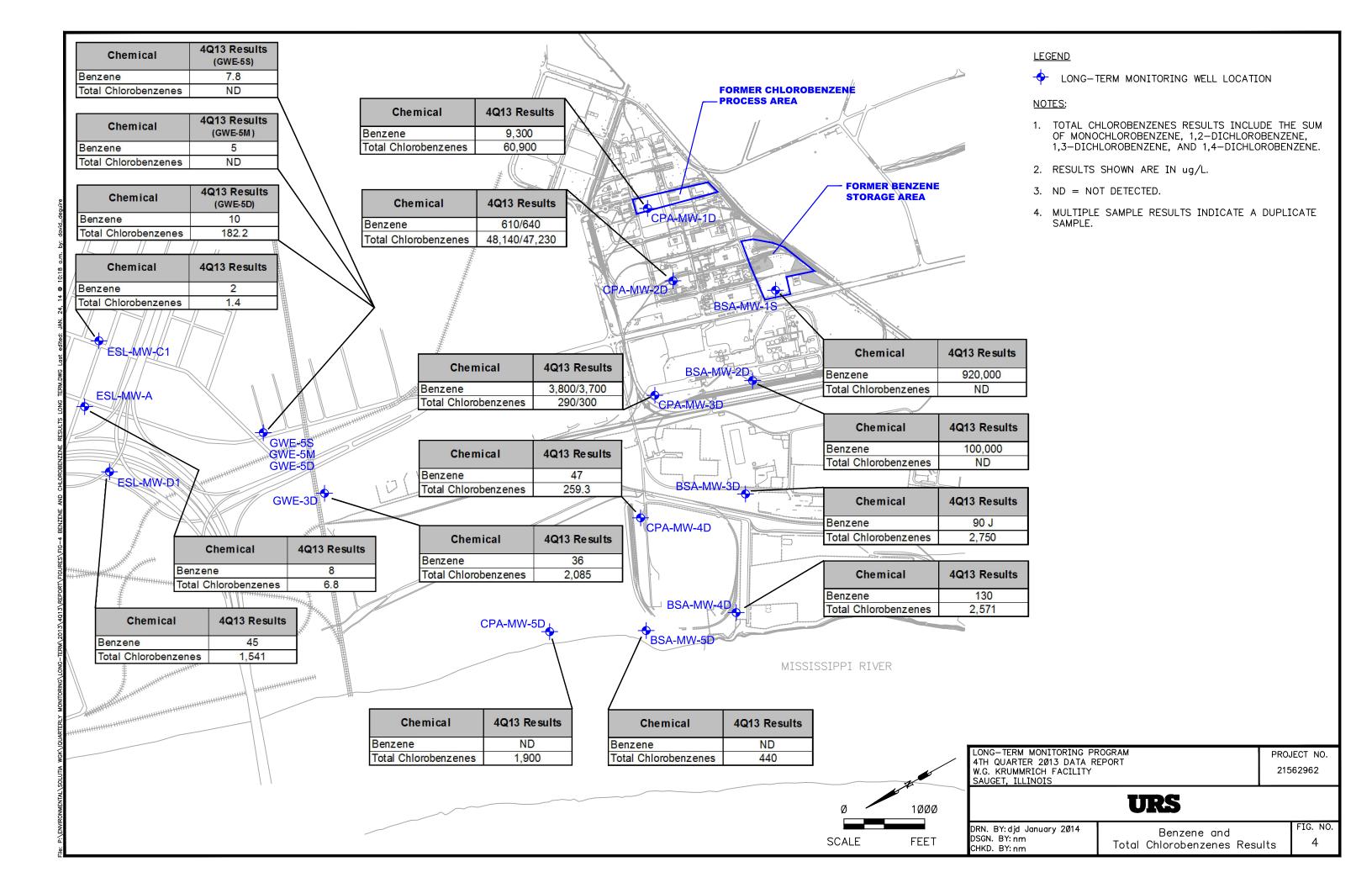
- Solutia Inc, 2009. Revised Long Term Monitoring Program Work Plan, Solutia Inc., W.G. Krummrich Facility, Sauget, Illinois, May 2009.
- USEPA, 2010. Contract Laboratory Program National Functional Guidelines for Superfund Inorganic Data Review.
- USEPA, 2008. Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review.

## **Figures**









## **Tables**

Table 1
Monitoring Well Gauging Information

			Construct	ion Details			October 30-31, 2013				
Well ID	Ground Elevation* (feet)	Casing Elevation* (feet)	Depth to Top of Screen (feet bgs)	Depth to Bottom of Screen (feet bgs)	Top of Screen Elevation* (feet)	Bottom of Screen Elevation* (feet)	Depth to Water (feet btoc)	NAPL Thickness (feet)	Depth to Bottom** (feet btoc)	Water Elevation* (feet)	
<b>Shallow Hydrogeolo</b>	gic Unit (SH	U 395-380 fe									
BSA-MW-1S	409.49	412.31	19.68	24.68	389.81	384.81	20.08	-	27.34	392.23	
GWE-5S	408.47	408.05	17.91	27.91	390.56	380.56	20.13	-	27.91	387.92	
Middle Hydrogeolog	ic Unit (MHL	J 380-350 fee	et NAVD 88)								
GWE-5M	408.59	408.20	48.10	58.10	360.49	350.49	20.35	-	58.10	387.85	
PMA-MW-1M	410.32	410.08	54.54	59.54	355.78	350.78	16.24	1	59.65	393.84	
PMA-MW-2M	412.26	411.93	56.87	61.87	355.39	350.39	18.03	1	51.32	393.90	
PMA-MW-3M	412.36	412.10	57.07	62.07	355.29	350.29	18.06	1	61.84	394.04	
PMA-MW-5M	411.27	410.97	52.17	57.17	359.10	354.10	17.72	-	57.02	393.25	
PS-MW-1M	409.37	412.59	37.78	42.78	371.59	366.59	17.25	-	46.07	395.34	
Deep Hydrogeologic											
BSA-MW-2D	412.00	415.13	68.92	73.92	343.08	338.08	25.26	-	77.05	389.87	
BSA-MW-3D	412.91	415.74	107.02	112.02	305.89	300.89	28.61	-	114.83	387.13	
BSA-MW-4D	425.00	424.69	118.54	123.54	306.46	301.46	39.69	-	123.22	385.00	
BSA-MW-5D	420.80	420.49	115.85	120.85	304.95	299.95	36.36	-	121.00	384.13	
CPA-A-DHU	413.95	416.24	108	113.3	305.95	300.65	20.93	-	115.21	395.31	
CPA-B-DHU	409.12	408.68	101	106.5	308.12	302.62	14.05	-	105.55	394.63	
CPA-C-DHU	408.92	408.57	101	106	307.92	302.92	14.11	-	105.57	394.46	
CPA-D-DHU	409.63	412.20	101	105.9	308.63	303.73	17.82	-	108.34	394.38	
CPA-MW-1D	408.62	412.23	66.12	71.12	342.50	337.50	18.35	-	74.69	393.88	
CPA-MW-2D	408.51	408.20	99.96	104.96	308.55	303.55	16.61	-	104.66	391.59	
CPA-MW-3D	410.87	410.67	108.20	113.20	302.67	297.67	20.32	-	112.87	390.35	
CPA-MW-4D	421.57	421.20	116.44	121.44	305.13	300.13	34.96	1	121.03	386.24	
CPA-MW-5D	411.03	413.15	107.63	112.63	303.40	298.40	31.06	1	111.90	382.09	
DNAPL-K-1	413.07	415.56	108.20	123.20	304.87	289.87	20.41	1	123.19	395.15	
DNAPL-K-2	407.94	407.72	97.63	112.63	310.31	295.31	13.99	-	112.38	393.73	
DNAPL-K-3	412.13	415.91	104.80	119.80	307.33	292.33	21.69	-	123.35	394.22	
DNAPL-K-4	409.48	412.53	102.55	117.55	306.93	291.93	19.16	-	118.06	393.37	
DNAPL-K-5	412.27	411.91	102.15	117.15	310.12	295.12	17.76	-	116.52	394.15	
DNAPL-K-6	410.43	410.09	102.47	117.47	307.96	292.96	16.80	-	116.96	393.29	

Table 1
Monitoring Well Gauging Information

			Construct	ion Details				Oct	tober 30-31,	2013	
Well ID	Ground Elevation* (feet)	Casing Elevation* (feet)	Depth to Top of Screen (feet bgs)	Depth to Bottom of Screen (feet bgs)	Top of Screen Elevation* (feet)	Bottom of Screen Elevation* (feet)	Depth to Water (feet btoc)	NAPL Thickness (feet)	Depth to Bottom** (feet btoc)	Water Elevation* (feet)	
Deep Hydrogeologic Unit (DHU 350 feet NAVD 88 - Bedrock) (continued)											
DNAPL-K-7	408.32	407.72	100.40	115.40	307.92	292.92	14.87	-	115.38	392.85	
DNAPL-K-8	408.56	411.38	102.65	117.65	305.91	290.91	19.45	-	117.61	391.93	
DNAPL-K-9	406.45	405.97	97.42	112.42	309.03	294.03	14.06	-	111.25	391.91	
DNAPL-K-10	413.50	413.25	105.43	120.43	308.07	293.07	18.72	-	120.26	394.53	
DNAPL-K-11	412.20	411.78	105.46	120.46	306.74	291.74	19.05	-	120.26	392.73	
GM-9C	409.54	411.21	88.00	108.00	321.54	301.54	17.72	-	108.34	393.49	
GWE-1D	412.80	415.60	117.00	127.00	295.80	285.80	34.18	-	128.55	381.42	
GWE-2D	417.45	417.14	127.00	137.00	290.45	280.45	33.48	-	136.72	383.66	
GWE-3D	415.03	417.66	104.60	114.60	313.06	303.06	30.82	-	114.94	386.84	
GWE-4D	406.05	405.74	74.00	80.00	332.05	326.05	16.70	-	78.80	389.04	
GWE-5D	408.79	408.38	100.43	105.43	308.36	303.36	20.74	-	105.32	387.64	
GWE-10D	410.15	412.87	102.50	112.50	307.65	297.65	21.42	-	114.86	391.45	
GWE-14D	420.47	422.90	90.00	96.00	330.47	324.47	37.57	-	97.09	385.33	
ESL-MW-A	412.93	412.59	105.50	110.50	307.43	302.43	24.28	-	109.96	388.31	
ESL-MW-C1	410.09	409.79	104.00	109.00	306.09	301.09	19.84	-	108.70	389.95	
ESL-MW-D1	416.38	416.04	114.00	119.00	302.38	297.38	28.61	-	119.33	387.43	
PMA-MW-4D	411.22	410.88	68.84	73.84	342.38	337.38	16.65	-	73.35	394.23	
PMA-MW-6D	407.63	407.32	96.49	101.49	311.14	306.14	15.22	-	101.34	392.10	
PS-MW-6D	404.11	406.63	102.32	107.32	304.31	299.31	18.94	-	109.86	387.69	
PS-MW-9D	403.92	403.52	100.40	105.40	303.52	298.52	12.83		105.17	390.69	
PS-MW-10D	409.63	412.18	103.78	108.78	308.40	303.40	27.33	-	111.31	384.85	
PS-MW-13D	405.80	405.53	106.08	111.08	299.72	294.72	18.10	-	110.62	387.43	
PS-MW-17D	420.22	423.26	121.25	126.25	298.97	293.97	40.98	-	134.03	382.28	
SA2-MW-1D	403.79	406.03	105.01	115.01	301.02	291.02	27.49	-	102.31	378.54	

#### Notes:

\* - Elevation based upon North American Vertical Datum (NAVD) 88 datum

\*\* - Total depths are measured annually during the first quarter of each year

bgs - below ground surface btoc - below top of casing NM - not measured

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Table 2
Groundwater Analytical Results

			1	VOCs (µg/L)		
Sample ID	Sample Date	Benzene	Chlorobenzene	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene
<b>BENZENE STORAGE AR</b>	EA					
BSA-MW-1S-1113	11/5/2013	920,000	<10,000	<10,000	<10,000	<10,000
BSA-MW-2D-1113	11/6/2013	100,000	<2,000	<2,000	<2,000	<2,000
BSA-MW-3D-1113	11/5/2013	90 J	2,400	<50	<50	350
BSA-MW-4D-1113	11/4/2013	130	2,500	<25	<25	71
BSA-MW-5D-1113	11/4/2013	<5	440	<5	<5	<5
CHLOROBENZENE PRO	CESS AREA					
CPA-MW-1D-1113	11/5/2013	9,300	23,000	21,000	1,900	15,000
CPA-MW-2D-1113	11/5/2013	610	36,000	640	500	11,000
CPA-MW-2D-1113-AD	11/5/2013	640	35,000	730	500	11,000
CPA-MW-3D-1113	11/6/2013	3,800	290	<100	<100	<100
CPA-MW-3D-1113-AD	11/6/2013	3,700	300	<50	<50	<50
CPA-MW-4D-1113	11/4/2013	47	250	5.9	<2	3.4
CPA-MW-5D-1113	11/4/2013	<20	1,900	<20	<20	<20
AREA NORTH OF WGK						
ESL-MW-A-1113	11/8/2013	8.3	4.2	<1	<1	2.6
ESL-MW-C1-1113	11/8/2013	1.5	<1	<1	<1	1.4
ESL-MW-D1-1113	11/8/2013	45	1,500	<25	<25	41
GWE-3D-1113	11/7/2013	36	1,900	25	<25	160
GWE-5S-1113	11/7/2013	7.8	<1	<1	<1	<1
GWE-5M-1113	11/7/2013	5	<1	<1	<1	<1
GWE-5D-1113	11/7/2013	9.6	160	4.2	<2	18

### Notes:

μg/L = micrograms per liter

< = Result is non-detect, less than the reporting limit given.

J = estimated value

**BOLD** indicates concentration greater than reporting limit.

AD = Analytical Duplicate

Table 3 **Monitored Natural Attenuation Results Summary** 

Alkalinity ( Carbon Dic Carbon Dic Chloride (n Chloride (n Chloride (n Manganese Manganese Manganese Manganese Total Organ Total Organ Dissolved ( mg/L)	
BSA-MW-1S-1113 11/5/2013 760 41 100 -0.02 <1.1 <1 8.3 0.87 7000 <0.05 <5 7.2	-171.91
50. mm 10 mm	171.51
BSA-MW-1S-F(0.2)-1113 11/5/2013 >3.30 8.2 0.87 6.7 J	
BSA-MW-2D-1113	-140.31
BSA-MW-2D-F(0.2)-1113 11/6/2013 3.07 3.7 J 0.56 J 5.5 J	
BSA-MW-3D-1113 11/5/2013 440 29 120 0.04 3.3 <1 10 0.52 1900 <0.05 64 3.4	-129.18
BSA-MW-3D-F(0.2)-1113 11/5/2013 >3.30 10 0.53 3.6	1100
BSA-MW-4D-1113 11/4/2013 480 30 94 0.09 3.8 <1 7.3 0.55 840 <0.05 110 4	-116.8
BSA-MW-4D-F(0.2)-1113 11/4/2013 >3.30 7 0.53 4.4	100 =
BSA-MW-5D-1113 11/4/2013 640 49 290 -0.01 15 <1 12 0.28 13000 <0.05 <5 6.6 J	-132.5
BSA-MW-5D-F(0.2)-1113 11/4/2013 12 0.28 7.3	
CHLOROBENZENE PROCESS AREA	
CPA-MW-1D-1113 11/5/2013 720 <5 100 -0.09 <1.1 <1 0.2 0.036 <0.58 <0.05 <5 11	-117.81
CPA-MW-1D-F(0.2)-1113 11/5/2013 0 0.026 10 U	
CPA-MW-2D-1113 11/5/2013 470 30 48 0.32 2 <1 6.4 0.36 850 <0.05 59 8.8	-122.81
CPA-MW-2D-F(0.2)-1113 11/5/2013 >3.30 7 0.4 7.9	10100
CPA-MW-3D-1113 11/6/2013 620 42 310 -0.04 22 <1 12 J 0.74 J 20000 <0.05 <5 8.2	-124.09
CPA-MW-3D-F(0.2)-1113 11/6/2013 12J 0.72J 8.2J	4.40.40
CPA-MW-4D-1113 11/4/2013 620 43 170 0.09 12 <1 12 0.3 9800 <0.05 <5 7.3 J	-142.46
CPA-MW-4D-F(0.2)-1113 11/4/2013 >3.30 11 0.29 8.2	20.04
CPA-MW-5D-1113	-99.84
AREA NORTH OF WGK	105.00
ESL-MW-A-1113 11/8/2013 370 32 97 -0.07 <1.1 <1 16 0.46 4 <0.05 620 3.1	-125.23
ESL-MW-A-F(0.2)-1113	-122.31
ESL-MW-C1-1113	-122.31
ESL-MV-01-r(02)-1113 11/8/2013 380 36 120 -0.05 <1.1 <1 5.3 0.4 44 <0.05 570 3.2	-120.73
	-120.73
ESL-MW-D1-F(0.2)-1113	-154.06
GWE-3D-F113 11/7/2013 390 43 870 0.1 <1.1 <1 20 0.74 35 <0.00 410 4.9 (GWE-3D-F10.2)-1113 11/7/2013 9.3.30 26 0.76 4.8	-134.00
GWE-53-F(0.2)+113 11/7/2013 440 49 34 0.1 <1.1 <1 <0.05 0.24 1.2 0.37 100 4.2	59.58
GWE-5S-F(0.2)-1113 11/7/2013 0 0 <0.05 0.24 1.2 0.37 100 4.2	39.30
GWE-50-F(U.2)**113	-147.94
GWE-5MF-FIG.2)-1113 117/2013 430 40 51 -0.07 <1.1 <1 22 1.2 31 <0.03 100 1.8 1.7 (GWE-5MF-FIG.2)-1113 117/2013 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.7	-147.34
GWE-50-1113 11/7/2013 330 28 94 -0.03 <1.1 <1 16 0.43 45 <0.05 460 2.6	-148.83
GWE-50-F(0.2)-1113 117/2013 350 26 54 50.05 111 1 >3.30 16 0.42 2.5	140.00

#### Notes:

DO and ORP were measured in the field using an In-Situ Troll 9500 equipped with a flow-thru cell. Values presented represent final measurements before sampling. Ferrous Iron readings were measured in the field using a Hach DR-890 Colorimeter after the groundwater passed through a 0.2 µm filter

F(0.2) = Sample was filtered utilizing a 0.2  $\mu$ m filter during sample collection

H = prepped or analyzed outside of specified holding time

J = estimated detected value

mg/L = milligrams per liter

mV = millivolts

ug/L = micrograms per liter < = Result is non-detect, less than the reporting limit given - indicated as a U qualifier on lab data

A blank space indicates sample not analyzed for select analyte.

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January 2014

# Appendix A Groundwater Purging and Sampling Forms



**Troll 9000** 11/05/13

**Pump Information:** 

Low-Flow System ISI Low-Flow Log

Project Information:

**Operator Name** dm mc Pump Model/Type Proactive SS Monsoon **URS** Corporation **LDPE** Company Name **Tubing Type Project Name** Solutia WGK **Tubing Diameter** 0.19 [in] Site Name Quarterly Groundwater Sampling - LTM **Tubing Length** 31 [ft] Pump placement from TOC 25 [ft]

Well Information: Pumping information:

Well Id Final pumping rate 300 [mL/min] BSA-MW-1S Flowcell volume Well diameter 2 [in] 772.84 [mL] Well total depth 27.34 [ft] Calculated Sample Rate 155 [sec] Depth to top of screen 22.5 [ft] Sample rate 155 [sec] Screen length 60 [in] Stabilized drawdown 0 [in] Depth to Water 20.5 [ft]

### **Low-Flow Sampling Stabilization Summary**

	Time	Temp [F]	pH [pH]	Cond [µS/cm @25C]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1	+/-1	+/-0.2	+/-20
				+/-3 %	+/-10 %	+/-10 %	
	10:02:24	66.47	7.09	1874.67	17.42	0.00	-171.30
	10:05:04	67.06	7.09	1884.40	22.10	0.00	-171.43
Last 5 Readings	10:07:45	67.13	7.09	1890.68	30.31	-0.03	-171.78
	10:10:25	66.98	7.09	1892.82	33.85	-0.03	-172.03
	10:13:06	66.87	7.09	1892.34	4.44	-0.02	-171.91
	10:07:45	0.07	0.00	6.28	8.21	-0.02	-0.34
Variance in last 3 readings	10:10:25	-0.15	0.00	2.15	3.55	0.00	-0.26
	10:13:06	-0.11	0.00	-0.48	-29.41	0.01	0.13



**Troll 9000** 11/06/13

Low-Flow System ISI Low-Flow Log

**Project Information:** 

Operator Name dm sj
Company Name URS Corporation
Project Name Solutia WGK
Site Name Quarterly Groundwater Sampling - LTM

**Pump Information:** 

Pump Model/Type Proactive SS Monsoon
Tubing Type LDPE
Tubing Diameter 0.19 [in]
Tubing Length 80.55 [ft]
Pump placement from TOC 0 [ft]

**Well Information:** 

 Well Id
 BSA-MW-2D

 Well diameter
 2 [in]

 Well total depth
 77.05 [ft]

 Depth to top of screen
 72.05 [ft]

 Screen length
 60 [in]

 Depth to Water
 25.5 [ft]

**Pumping information:** 

Final pumping rate 400 [mL/min]
Flowcell volume 1049.1 [mL]
Calculated Sample Rate 158 [sec]
Sample rate 158 [sec]
Stabilized drawdown 0 [in]

## **Low-Flow Sampling Stabilization Summary**

	Time	Temp [C]	pH [pH]	Cond [µS/cm @25C]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1	+/-1	+/-0.2	+/-20
				+/-3 %	+/-10 %	+/-10 %	
	11:34:36	16.43	7.14	1578.19	689.48	0.00	-137.23
	11:37:19	16.46	7.16	1582.16	18.86	-0.04	-138.38
Last 5 Readings	11:40:03	16.56	7.16	1584.73	262.73	-0.05	-139.32
	11:42:46	16.54	7.17	1585.37	64.10	-0.06	-140.14
	11:45:30	16.49	7.17	1578.91	3.93	-0.06	-140.31
	11:40:03	0.10	0.01	2.57	243.87	-0.01	-0.94
Variance in last 3 readings	11:42:46	-0.02	0.01	0.65	-198.63	-0.02	-0.81
	11:45:30	-0.05	0.00	-6.46	-60.17	0.00	-0.17



**Troll 9000** 11/05/13

Low-Flow System ISI Low-Flow Log

**Project Information:** 

Operator Name dm mc
Company Name URS Corporation
Project Name Solutia WGK
Site Name Quarterly Groundwater Sampling - LTM

**Pump Information:** 

Pump Model/Type Proactive SS Monsoon
Tubing Type LDPE
Tubing Diameter 0.19 [in]
Tubing Length 118.35 [ft]
Pump placement from TOC 112.35 [ft]

**Well Information:** 

 Well Id
 BSA-MW-3D

 Well diameter
 2 [in]

 Well total depth
 114.83 [ft]

 Depth to top of screen
 109.85 [ft]

 Screen length
 60 [in]

 Depth to Water
 28.6 [ft]

**Pumping information:** 

Final pumping rate 300 [mL/min]
Flowcell volume 1259.85 [mL]
Calculated Sample Rate 252 [sec]
Sample rate 252 [sec]
Stabilized drawdown 0 [in]

### **Low-Flow Sampling Stabilization Summary**

	Time	Temp [F]	pH [pH]	Cond [µS/cm @25C]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1	+/-1	+/-0.2	+/-20
				+/-3 %	+/-10 %	+/-10 %	
	14:58:58	62.71	6.94	1459.23	33.88	0.69	-120.71
	15:03:19	62.76	6.93	1461.37	5.76	0.25	-124.30
Last 5 Readings	15:07:40	62.66	6.92	1463.19	52.64	0.15	-127.04
	15:12:01	62.59	6.92	1462.39	4.21	0.04	-128.37
	15:16:23	62.61	6.92	1462.75	6.62	0.04	-129.18
	15:07:40	-0.09	0.00	1.82	46.88	-0.11	-2.74
Variance in last 3 readings	15:12:01	-0.07	-0.01	-0.80	-48.43	-0.10	-1.33
	15:16:23	0.02	0.00	0.36	2.41	0.00	-0.81



**Troll 9000** 11/04/13

Low-Flow System ISI Low-Flow Log

**Project Information:** 

Operator Name dm mc
Company Name URS Corporation
Project Name Solutia WGK
Site Name Quarterly Groundwater Sampling - LTM

**Pump Information:** 

Pump Model/Type Proactive SS Monsoon
Tubing Type LDPE
Tubing Diameter 0.19 [in]
Tubing Length 126.73 [ft]
Pump placement from TOC 120.73 [ft]

**Well Information:** 

 Well Id
 BSA-MW-4D

 Well diameter
 2 [in]

 Well total depth
 123.22 [ft]

 Depth to top of screen
 118.23 [ft]

 Screen length
 60 [in]

 Depth to Water
 39.46 [ft]

**Pumping information:** 

Final pumping rate 400 [mL/min]
Flowcell volume 1306.58 [mL]
Calculated Sample Rate 196 [sec]
Sample rate 196 [sec]
Stabilized drawdown 0 [in]

## **Low-Flow Sampling Stabilization Summary**

	Time	Temp [F]	pH [pH]	Cond [µS/cm @25C]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1	+/-1	+/-0.2	+/-20
				+/-3 %	+/-10 %	+/-10 %	
	13:25:06	61.91	6.92	1492.87	20.16	0.21	-114.61
	13:28:29	61.94	6.93	1493.44	19.10	0.18	-115.47
Last 5 Readings	13:31:52	62.00	6.92	1493.16	25.54	0.13	-116.03
	13:35:16	62.03	6.92	1495.99	61.66	0.10	-116.50
	13:38:39	61.97	6.93	1490.83	0.41	0.09	-116.80
	13:31:52	0.06	0.00	-0.28	6.44	-0.06	-0.56
Variance in last 3 readings	13:35:16	0.02	0.00	2.83	36.12	-0.03	-0.47
	13:38:39	-0.05	0.00	-5.16	-61.25	-0.01	-0.30



**Troll 9000** 11/04/13

Low-Flow System ISI Low-Flow Log

**Project Information:** 

Operator Name dm mc
Company Name URS Corporation
Project Name Solutia WGK
Site Name Quarterly Groundwater Sampling - LTM

**Pump Information:** 

Pump Model/Type Proactive SS Monsoon
Tubing Type LDPE
Tubing Diameter 0.19 [in]
Tubing Length 124.04 [ft]
Pump placement from TOC 118.04 [ft]

**Well Information:** 

 Well Id
 BSA-MW-5D

 Well diameter
 2 [in]

 Well total depth
 121 [ft]

 Depth to top of screen
 115.54 [ft]

 Screen length
 60 [in]

 Depth to Water
 35.8 [ft]

**Pumping information:** 

Final pumping rate 400 [mL/min]
Flowcell volume 1291.58 [mL]
Calculated Sample Rate 194 [sec]
Sample rate 194 [sec]
Stabilized drawdown 0 [in]

## **Low-Flow Sampling Stabilization Summary**

	Time	Temp [F]	pH [pH]	Cond [µS/cm @25C]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1	+/-1	+/-0.2	+/-20
				+/-3 %	+/-10 %	+/-10 %	
	15:02:45	63.30	6.95	2243.64	19.46	0.01	-134.72
	15:06:06	63.26	6.99	2247.93	12.90	0.93	-117.78
Last 5 Readings	15:09:27	63.25	6.95	2283.56	67.48	0.05	-127.58
	15:12:48	63.28	6.95	2246.19	38.01	0.05	-130.40
	15:16:09	63.26	6.95	2253.05	2.53	-0.01	-132.50
	15:09:27	-0.01	-0.04	35.63	54.58	-0.88	-9.80
Variance in last 3 readings	15:12:48	0.03	0.00	-37.37	-29.47	-0.01	-2.82
	15:16:09	-0.03	0.00	6.86	-35.47	-0.05	-2.10



**Troll 9000** 11/05/13

Low-Flow System ISI Low-Flow Log

Project Information: Pump Information:

**Operator Name** dm mc Pump Model/Type Proactive SS Monsoon **URS** Corporation Company Name **Tubing Type** LDPE **Project Name** Solutia WGK **Tubing Diameter** 0.19 [in] Site Name Quarterly Groundwater Sampling - LTM **Tubing Length** 73.32 [ft] Pump placement from TOC 68.32 [ft]

Well Information: Pumping information:

Well Id Final pumping rate CPA-MW-1D 300 [mL/min] Well diameter 2 [in] Flowcell volume 1008.79 [mL] Well total depth 74.69 [ft] Calculated Sample Rate 202 [sec] Depth to top of screen 65.82 [ft] Sample rate 202 [sec] Screen length 60 [in] Stabilized drawdown 0 [in] Depth to Water 18.66 [ft]

### **Low-Flow Sampling Stabilization Summary**

	Time	Temp [F]	pH [pH]	Cond [µS/cm @25C]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1	+/-1	+/-0.2	+/-20
				+/-3 %	+/-10 %	+/-10 %	
	13:22:49	66.17	8.58	1768.40	0.27	-0.04	-96.25
	13:26:19	66.24	8.62	1796.98	0.22	-0.05	-103.95
Last 5 Readings	13:29:49	66.30	8.67	1828.87	-0.23	-0.07	-109.64
	13:33:18	66.21	8.71	1844.99	-0.08	-0.08	-113.79
	13:36:47	65.94	8.75	1861.54	6.86	-0.09	-117.81
	13:29:49	0.06	0.05	31.89	-0.45	-0.02	-5.69
Variance in last 3 readings	13:33:18	-0.09	0.04	16.12	0.15	-0.01	-4.15
	13:36:47	-0.26	0.04	16.55	6.94	-0.01	-4.02



**Troll 9000** 11/05/13

Low-Flow System ISI Low-Flow Log

**Project Information:** 

Operator Name dm mc
Company Name URS Corporation
Project Name Solutia WGK
Site Name Quarterly Groundwater Sampling - LTM

**Pump Information:** 

Pump Model/Type Proactive SS Monsoon
Tubing Type LDPE
Tubing Diameter 0.19 [in]
Tubing Length 108.15 [ft]
Pump placement from TOC 102.15 [ft]

**Well Information:** 

 Well Id
 CPA-MW-2D

 Well diameter
 2 [in]

 Well total depth
 104.66 [ft]

 Depth to top of screen
 99.65 [ft]

 Screen length
 60 [in]

 Depth to Water
 16.96 [ft]

**Pumping information:** 

Final pumping rate 400 [mL/min]
Flowcell volume 1202.98 [mL]
Calculated Sample Rate 181 [sec]
Sample rate 181 [sec]
Stabilized drawdown 0 [in]

## **Low-Flow Sampling Stabilization Summary**

	Time	Temp [F]	pH [pH]	Cond [µS/cm @25C]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1	+/-1	+/-0.2	+/-20
				+/-3 %	+/-10 %	+/-10 %	
	11:42:49	65.98	6.94	1155.04	19.65	0.48	-120.24
	11:45:56	66.11	6.94	1163.47	16.74	0.45	-121.10
Last 5 Readings	11:49:05	66.13	6.94	1171.05	14.98	0.43	-121.70
	11:52:11	66.08	6.94	1177.37	13.82	0.38	-122.34
	11:55:19	66.15	6.94	1183.64	14.67	0.32	-122.81
	11:49:05	0.02	0.00	7.59	-1.75	-0.02	-0.60
Variance in last 3 readings	11:52:11	-0.05	0.00	6.32	-1.16	-0.05	-0.64
	11:55:19	0.06	0.00	6.26	0.85	-0.06	-0.47



**Troll 9000** 11/06/13

Low-Flow System ISI Low-Flow Log

**Project Information:** 

Operator Name dm sj
Company Name URS Corporation
Project Name Solutia WGK
Site Name Quarterly Groundwater Sampling - LTM

**Pump Information:** 

Pump Model/Type Proactive SS Monsoon
Tubing Type LDPE
Tubing Diameter 0.19 [in]
Tubing Length 116.5 [ft]
Pump placement from TOC 0 [ft]

**Well Information:** 

 Well Id
 CPA-MW-3D

 Well diameter
 2 [in]

 Well total depth
 112.87 [ft]

 Depth to top of screen
 108 [ft]

 Screen length
 60 [in]

 Depth to Water
 20.48 [ft]

**Pumping information:** 

Final pumping rate 400 [mL/min]
Flowcell volume 1249.54 [mL]
Calculated Sample Rate 188 [sec]
Sample rate 188 [sec]
Stabilized drawdown 0 [in]

### **Low-Flow Sampling Stabilization Summary**

	Time	Temp [C]	pH [pH]	Cond [µS/cm @25C]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1	+/-1	+/-0.2	+/-20
				+/-3 %	+/-10 %	+/-10 %	
	13:56:19	17.10	7.01	2131.25	161.58	-0.03	-123.75
	13:59:34	17.02	7.01	2123.48	59.32	-0.06	-124.22
Last 5 Readings	14:02:50	16.83	7.01	2119.91	23.79	-0.06	-124.48
	14:06:04	16.76	7.01	2132.96	157.96	-0.03	-124.52
	14:09:18	16.28	7.01	2114.94	2.37	-0.04	-124.09
	14:02:50	-0.19	0.00	-3.57	-35.52	0.00	-0.26
Variance in last 3 readings	14:06:04	-0.06	0.00	13.05	134.17	0.03	-0.04
	14:09:18	-0.49	0.00	-18.02	-155.59	-0.01	0.43



**Troll 9000** 11/04/13

Low-Flow System ISI Low-Flow Log

Project Information:

Operator Name dm mc
Company Name URS Corporation
Project Name Solutia WGK
Site Name Quarterly Groundwater Sampling - LTM

**Pump Information:** 

Pump Model/Type Proactive SS Monsoon
Tubing Type LDPE
Tubing Diameter 0.19 [in]
Tubing Length 124.57 [ft]
Pump placement from TOC 118.57 [ft]

**Well Information:** 

 Well Id
 CPA-MW-4D

 Well diameter
 2 [in]

 Well total depth
 121.03 [ft]

 Depth to top of screen
 116.07 [ft]

 Screen length
 60 [in]

 Depth to Water
 34.86 [ft]

**Pumping information:** 

Final pumping rate 400 [mL/min]
Flowcell volume 1294.53 [mL]
Calculated Sample Rate 195 [sec]
Sample rate 195 [sec]
Stabilized drawdown 0 [in]

### **Low-Flow Sampling Stabilization Summary**

	Time	Temp [F]	pH [pH]	Cond [µS/cm @25C]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1	+/-1	+/-0.2	+/-20
				+/-3 %	+/-10 %	+/-10 %	
	11:31:02	61.57	6.96	1760.25	53.24	0.28	-132.93
	11:34:24	61.70	6.96	1766.12	71.15	0.19	-137.20
Last 5 Readings	11:37:46	61.74	6.96	1770.22	416.03	0.15	-139.68
	11:41:08	61.60	6.96	1797.79	1.17	0.13	-141.01
	11:44:30	61.64	6.96	1790.87	8.66	0.09	-142.46
	11:37:46	0.04	0.00	4.10	344.88	-0.04	-2.48
Variance in last 3 readings	11:41:08	-0.13	0.00	27.58	-414.86	-0.02	-1.33
	11:44:30	0.03	0.00	-6.92	7.50	-0.04	-1.45



**Troll 9000** 11/04/13

Low-Flow System ISI Low-Flow Log

**Project Information:** 

Operator Name dm mc
Company Name URS Corporation
Project Name Solutia WGK
Site Name Quarterly Groundwater Sampling - LTM

**Pump Information:** 

Pump Model/Type Proactive SS Monsoon
Tubing Type LDPE
Tubing Diameter 0.19 [in]
Tubing Length 118.25 [ft]
Pump placement from TOC 112.25 [ft]

**Well Information:** 

 Well Id
 CPA-MW-5D

 Well diameter
 2 [in]

 Well total depth
 111.9 [ft]

 Depth to top of screen
 109.75 [ft]

 Screen length
 60 [in]

 Depth to Water
 30.45 [ft]

**Pumping information:** 

Final pumping rate 400 [mL/min]
Flowcell volume 1259.3 [mL]
Calculated Sample Rate 189 [sec]
Sample rate 189 [sec]
Stabilized drawdown 0 [in]

### **Low-Flow Sampling Stabilization Summary**

	Time	Temp [F]	pH [pH]	Cond [µS/cm @25C]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1	+/-1	+/-0.2	+/-20
				+/-3 %	+/-10 %	+/-10 %	
	9:50:18	59.72	6.63	1948.30	46.22	0.11	-101.64
	9:53:35	59.98	6.99	2.80	-0.65	8.32	-113.02
Last 5 Readings	9:56:51	60.27	6.64	1952.93	-1.11	0.22	-93.30
	10:00:06	60.27	6.63	1956.69	-0.91	0.08	-97.45
	10:03:22	60.28	6.63	1957.91	-0.31	0.06	-99.84
	9:56:51	0.30	-0.34	1950.13	-0.46	-8.10	19.72
Variance in last 3 readings	10:00:06	-0.01	-0.01	3.76	0.20	-0.14	-4.15
	10:03:22	0.01	0.00	1.22	0.60	-0.03	-2.40



**Troll 9000** 11/08/13

Low-Flow System ISI Low-Flow Log

**Project Information:** 

Operator Name dm sj
Company Name URS Corporation
Project Name Solutia WGK
Site Name Quarterly Groundwater Sampling - ESL

**Pump Information:** 

Pump Model/Type Proactive SS Monsoon
Tubing Type LDPE
Tubing Diameter 0.19 [in]
Tubing Length 112.5 [ft]
Pump placement from TOC 107.66 [ft]

**Well Information:** 

 Well Id
 ESL-MW-A

 Well diameter
 2 [in]

 Well total depth
 109.96 [ft]

 Depth to top of screen
 105.16 [ft]

 Screen length
 60 [in]

 Depth to Water
 24.5 [ft]

**Pumping information:** 

Final pumping rate
Flowcell volume
Calculated Sample Rate
Sample rate
Stabilized drawdown
400 [mL/min]
1227.24 [mL]
185 [sec]
185 [sec]
0 [in]

## **Low-Flow Sampling Stabilization Summary**

	Time	Temp [F]	pH [pH]	Cond [µS/cm @25C]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1	+/-1	+/-0.2	+/-20
				+/-3 %	+/-10 %	+/-10 %	
	13:35:21	60.67	6.91	2177.63	10.73	-0.04	-123.34
	13:38:33	60.72	6.90	2177.47	11.05	-0.05	-124.11
Last 5 Readings	13:41:45	60.77	6.91	2180.48	20.41	-0.06	-124.46
	13:44:56	60.88	6.91	2179.80	14.71	-0.07	-124.63
	13:48:08	60.95	6.91	2177.97	7.48	-0.07	-125.23
	13:41:45	0.06	0.00	3.01	9.36	0.00	-0.34
Variance in last 3 readings	13:44:56	0.11	0.00	-0.69	-5.70	-0.02	-0.17
	13:48:08	0.07	0.00	-1.83	-7.23	0.00	-0.60



**Troll 9000** 11/08/13

Low-Flow System ISI Low-Flow Log

**Project Information:** 

Operator Name dm sj
Company Name URS Corporation
Project Name Solutia WGK
Site Name Quarterly Groundwater Sampling - ESL

**Pump Information:** 

Pump Model/Type Proactive SS Monsoon
Tubing Type LDPE
Tubing Diameter 0.19 [in]
Tubing Length 111.19 [ft]
Pump placement from TOC 106.2 [ft]

**Well Information:** 

 Well Id
 ESL-MW-C1

 Well diameter
 2 [in]

 Well total depth
 108.7 [ft]

 Depth to top of screen
 103.7 [ft]

 Screen length
 60 [in]

 Depth to Water
 20.2 [ft]

**Pumping information:** 

Final pumping rate 400 [mL/min]
Flowcell volume 1219.93 [mL]
Calculated Sample Rate 183 [sec]
Sample rate 183 [sec]
Stabilized drawdown 0 [in]

### **Low-Flow Sampling Stabilization Summary**

	Time	Temp [F]	pH [pH]	Cond [µS/cm @25C]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1	+/-1	+/-0.2	+/-20
				+/-3 %	+/-10 %	+/-10 %	
	10:04:55	59.87	7.11	2180.32	117.62	0.17	-119.92
	10:08:05	59.88	6.99	2236.36	27.15	0.08	-117.82
Last 5 Readings	10:11:14	59.98	6.94	2273.64	9.71	0.04	-119.57
	10:14:24	60.01	6.92	2296.27	5.50	0.02	-121.11
	10:17:34	60.10	6.91	2312.76	4.70	0.00	-122.31
	10:11:14	0.10	-0.05	37.28	-17.44	-0.04	-1.75
Variance in last 3 readings	10:14:24	0.03	-0.02	22.63	-4.21	-0.03	-1.54
	10:17:34	0.09	-0.01	16.48	-0.80	-0.02	-1.20



**Troll 9000** 11/08/13

Low-Flow System ISI Low-Flow Log

**Project Information:** 

Operator Name dm sj
Company Name URS Corporation
Project Name Solutia WGK
Site Name Quarterly Groundwater Sampling - ESL

**Pump Information:** 

Pump Model/Type Proactive SS Monsoon
Tubing Type LDPE
Tubing Diameter 0.19 [in]
Tubing Length 121.78 [ft]
Pump placement from TOC 116.16 [ft]

**Well Information:** 

 Well Id
 ESL-MW-D1

 Well diameter
 2 [in]

 Well total depth
 119.33 [ft]

 Depth to top of screen
 113.66 [ft]

 Screen length
 60 [in]

 Depth to Water
 28.8 [ft]

**Pumping information:** 

Final pumping rate 400 [mL/min]
Flowcell volume 1278.98 [mL]
Calculated Sample Rate 192 [sec]
Sample rate 192 [sec]
Stabilized drawdown 0 [in]

#### **Low-Flow Sampling Stabilization Summary**

	Time	Temp [F]	pH [pH]	Cond [µS/cm @25C]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1	+/-1	+/-0.2	+/-20
				+/-3 %	+/-10 %	+/-10 %	
	11:52:03	61.00	6.86	2083.19	11.65	-0.04	-118.03
	11:55:22	60.98	6.86	2080.71	11.51	-0.04	-118.80
Last 5 Readings	11:58:41	60.98	6.86	2078.06	10.23	-0.05	-119.57
	12:02:00	60.94	6.86	2076.87	10.42	-0.04	-120.17
	12:05:19	60.89	6.86	2073.62	8.27	-0.05	-120.73
	11:58:41	0.01	0.00	-2.64	-1.28	0.00	-0.77
Variance in last 3 readings	12:02:00	-0.04	0.00	-1.20	0.19	0.00	-0.60
	12:05:19	-0.05	0.00	-3.24	-2.15	-0.01	-0.56



Troll 9000 11/07/13 Low-Flow System ISI Low-Flow Log

Project Information:	
Operator Name	dm sj
Company Name	URS Corporation

Project Name Solutia WGK
Site Name Quarterly Groundwater Sampling - LTM

Pump Information:

Pump Model/Type Peristaltic
Tubing Type LDPE
Tubing Diameter 0.19 [in]
Tubing Length 116 [ft]
Pump placement from TOC 112.23 [ft]

Well Information:

Well IdGWE-3DWell diameter1 [in]Well total depth114.94 [ft]Depth to top of screen107.23 [ft]Screen length120 [in]Depth to Water30.73 [ft]

#### **Pumping information:**

Final pumping rate 200 [mL/min]
Flowcell volume 600 [mL]
Calculated Sample Rate 180 [sec]
Sample rate 180 [sec]
Stabilized drawdown 0 [in]

#### **Low-Flow Sampling Stabilization Summary**

	Time	Temp [F]	pH [pH]	Cond [µS/cm @25C]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1	+/-1	+/-0.2	+/-20
				+/-3 %	+/-10 %	+/-10 %	
	15:11:11	61.73	6.81	4076.16	18.83	0.15	-164.55
	15:14:17	61.71	6.81	4078.01	37.85	0.13	-161.34
Last 5 Readings	15:17:24	61.67	6.80	4071.89	7.72	0.12	-158.30
	15:20:30	61.67	6.80	4069.59	25.16	0.11	-156.03
	15:23:37	61.51	6.80	4065.46	6.84	0.10	-154.06
	15:17:24	-0.04	-0.01	-6.12	-30.13	-0.01	3.04
Variance in last 3 readings	15:20:30	0.00	0.00	-2.30	17.44	-0.01	2.27
	15:23:37	-0.16	0.00	-4.13	-18.33	-0.01	1.97



Troll 9000 Low-Flow System 11/07/13 ISI Low-Flow Log

Project Information: Pump Information:

**Operator Name** Pump Model/Type dm sj Proactive SS Monsoon Company Name **URS** Corporation **Tubing Type** LDPE Project Name Solutia WGK **Tubing Diameter** 0.19 [in] Site Name Quarterly Groundwater Sampling - SUPP **Tubing Length** 28.49 [ft] Pump placement from TOC 24.05 [ft]

Well Information: Pumping information:

Well Id Final pumping rate GWE-5S 400 [mL/min] Well diameter Flowcell volume 600 [mL] 2 [in] Well total depth Calculated Sample Rate 90 [sec] 27.91 [ft] Depth to top of screen 90 [sec] 17.49 [ft] Sample rate Screen length 120 [in] Stabilized drawdown 0 [in] Depth to Water 0 [ft]

#### **Low-Flow Sampling Stabilization Summary**

	Time	Temp [C]	pH [pH]	Cond [µS/cm @25C]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1	+/-1	+/-0.2	+/-20
				+/-3 %	+/-10 %	+/-10 %	
	13:27:54	17.57	6.69	1150.90	15.25	0.12	51.88
	13:29:27	17.54	6.69	1149.94	21.06	0.12	53.77
Last 5 Readings	13:31:00	17.53	6.69	1148.89	19.90	0.12	55.56
	13:32:33	17.54	6.69	1148.15	19.94	0.11	57.57
	13:34:06	17.49	6.68	1146.38	19.86	0.10	59.58
	13:31:00	-0.01	0.00	-1.05	-1.15	-0.01	1.80
Variance in last 3 readings	13:32:33	0.02	0.00	-0.74	0.04	-0.01	2.01
	13:34:06	-0.06	0.00	-1.77	-0.08	-0.01	2.01



Troll 9000 Low-Flow System 11/07/13 ISI Low-Flow Log

Project Information: Pump Information:

**Operator Name** Pump Model/Type dm sj Proactive SS Monsoon Company Name **URS** Corporation **Tubing Type** LDPE Project Name Solutia WGK **Tubing Diameter** 0.19 [in] Site Name Quarterly Groundwater Sampling - SUPP **Tubing Length** 58.71 [ft] Pump placement from TOC 50.21 [ft]

Well Information: Pumping information:

Well Id Final pumping rate GWE-5M 400 [mL/min] Well diameter Flowcell volume 600 [mL] 2 [in] Well total depth Calculated Sample Rate 90 [sec] 58.1 [ft] Depth to top of screen 47.71 [ft] 90 [sec] Sample rate Screen length 120 [in] Stabilized drawdown 0 [in] Depth to Water 20.53 [ft]

#### **Low-Flow Sampling Stabilization Summary**

	Time	Temp [C]	pH [pH]	Cond [µS/cm @25C]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1	+/-1	+/-0.2	+/-20
				+/-3 %	+/-10 %	+/-10 %	
	11:50:30	16.23	6.87	1297.66	16.23	-0.07	-147.47
	11:52:03	16.24	6.88	1298.02	9.22	-0.07	-147.51
Last 5 Readings	11:53:36	16.24	6.88	1298.26	8.87	-0.07	-147.64
	11:55:09	16.25	6.88	1297.96	14.44	-0.07	-147.77
	11:56:42	16.25	6.88	1297.69	16.70	-0.07	-147.94
	11:53:36	0.00	0.00	0.24	-0.36	0.00	-0.13
Variance in last 3 readings	11:55:09	0.01	0.00	-0.30	5.57	0.00	-0.13
	11:56:42	0.00	0.00	-0.26	2.26	0.00	-0.17



Troll 9000 11/07/13 Low-Flow System ISI Low-Flow Log

#### **Project Information:**

Operator Name dm sj
Company Name URS Corporation
Project Name Solutia WGK
Site Name Quarterly Groundwater Sampling - SUPP

#### **Pump Information:**

Pump Model/Type Proactive SS Monsoon
Tubing Type LDPE
Tubing Diameter 0.19 [in]
Tubing Length 108.52 [ft]
Pump placement from TOC 102.52 [ft]

#### **Well Information:**

Well Id	GWE-5D
Well diameter	2 [in]
Well total depth	105.32 [ft]
Depth to top of screen	100.02 [ft]
Screen length	60 [in]
Depth to Water	20.91 [ft]

#### **Pumping information:**

Final pumping rate 400 [mL/min]
Flowcell volume 600 [mL]
Calculated Sample Rate 90 [sec]
Sample rate 90 [sec]
Stabilized drawdown 0 [in]

#### **Low-Flow Sampling Stabilization Summary**

	Time	Temp [C]	pH [pH]	Cond [µS/cm @25C]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1	+/-1	+/-0.2	+/-20
				+/-3 %	+/-10 %	+/-10 %	
	10:32:00	15.56	6.81	1743.14	14.65	-0.02	-148.23
	10:33:34	15.56	6.82	1743.78	11.84	-0.02	-150.80
Last 5 Readings	10:35:06	15.56	6.83	1745.38	10.33	-0.02	-148.57
	10:36:39	15.59	6.83	1745.16	11.43	-0.03	-148.74
	10:38:12	15.59	6.84	1745.35	9.98	-0.03	-148.83
	10:35:06	0.00	0.01	1.60	-1.51	0.00	2.22
Variance in last 3 readings	10:36:39	0.03	0.01	-0.23	1.10	0.00	-0.17
	10:38:12	0.00	0.01	0.19	-1.45	0.00	-0.09

# Appendix B Chains-of-Custody

# Page 35 of 37

#### Savannah -

5102 LaRoche Avenue Savannah, GA 31404

**Chain of Custody Record** 



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phone 912.354.7858 fax 912.352.0165																					l'estA	meric	:a La	borat	ories,	lnc.
Client Contact	Project Ma	anager: Bol	Billman		Site	Cor	tact:	: Mic	hael	Corb	ett	5	aic.			13				COC 1	No:					
URS Corporation	Tel/Fax: (3	314) 743-41	08			Lat	Cor	itact	: Mic	hele	Kers	ey		Carrie	er:	Fea	EX		200		$\underline{I}$	of	$=$ $\!$	_ co	Cs	
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(314) 429-0100 Phone		AT if different	from Below 🧲	Tand	avd				by 3	75						1 1				. 1				***************************************		
(314) 429-0462 FAX		2	2 weeks					_	ate	1 X			100			1 1			1		SDG N	٧o.				
Project Name: 4Q13 LTM GW Sampling		1	week					<u> </u>	Sul	y RS			y 6(	İ												
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5102 LaRoche Avenue

## **Chain of Custody Record**



Savannah, GA 31404

TestAmerica	
ger har til her frem film ståder eller kommer beskur har kallen skalle film film ståde ståde film film ståde s	
THE LEADER IN ENVIRONMENTAL TESTING	

Client Contact								tact:	Mich:	ael C	Corbe	tt	Da		10111	3	B			COC No:	
URS Corporation	Tel/Fax: (3	314) 743-410	08			Lab	Con	tact:	Mich	ele K	Cerse	y	Ca	rrier:	Fe	NE	X	AND DECEMBER	- ACOMPANY		COCs
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5102 LaRoche Avenue

#### **Chain of Custody Record**



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5102 LaRoche Avenue

# **Chain of Custody Record**



## Savannah, GA 31404

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Client Contact	Project Ma	nager: Bob	Billman			Site	Cont	act: I	Micha	ael C	Corbe	ett		<b>C</b> : //						COC N					
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5102 LaRoche Avenue

## **Chain of Custody Record**



Savannah, GA 31404

phone 912.354.7858 fax 912.352.0165																						7	FestAmerica Laboratories.	, Inc.
Client Contact	Pro	ect Ma	nager: Bob	Billman		A Contraction	Site	Cor	ıtact:	Mich	ael	Corb	ett										COC No:	
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# Appendix C Quality Assurance Report

#### QUALITY ASSURANCE REPORT

Solutia Inc. W.G. Krummrich Facility Sauget, Illinois

Long-Term Monitoring Program 4<sup>th</sup> Quarter 2013 Data Report

Prepared for

Solutia Inc. 575 Maryville Centre Drive St. Louis, MO 63141

January 2014



URS Corporation 1001 Highland Plaza Drive West, Suite 300 St. Louis, MO 63110 (314) 429-0100

Project # 21562962

#### **4Q13 QUALITY ASSURANCE REPORT**

1.0	INTRODUCTION	. 1
2.0	RECEIPT CONDITION AND SAMPLE HOLDING TIMES	. 4
3.0	TRIP BLANKS, LABORATORY METHOD BLANK AND EQUIPMENT BLANK SAMPLES	. 4
4.0	SURROGATE SPIKE RECOVERIES	.5
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6.0	MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) SAMPLES	.6
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#### 1.0 INTRODUCTION

This Quality Assurance Report presents the findings of a review of analytical data for groundwater samples collected in November of 2013 at the Solutia W.G. Krummrich plant as part of the 4<sup>th</sup> Quarter 2013 Long-Term Monitoring Program. The samples were collected by URS Corporation personnel and analyzed by TestAmerica Laboratories, Inc. located in Savannah, Georgia using USEPA methods, standard methods and USEPA SW-846 methodologies. Groundwater samples were tested for volatile organic compounds (VOCs), total and dissolved metals, dissolved gasses, and general chemistry parameters.

One hundred percent of the data were subjected to a Level III data quality review. The Level III data reviews were performed in order to confirm that the analytical data provided by TestAmerica Savannah were acceptable in quality for their intended use.

A total of twenty-one groundwater samples (seventeen investigative samples, two field duplicate pair, and one MS/MSD pair) were prepared and analyzed by TestAmerica Savannah for combinations of VOCs, dissolved gases, metals, and general chemistry. Additionally, two equipment blanks were collected and analyzed by TestAmerica. Five trip blank sets were included in the coolers that contained groundwater VOC samples and were analyzed for VOCs by USEPA SW-846 Method 8260B. These samples were analyzed as three sample delivery groups (SDGs) KPS097, KPS098, KPS099, KPS100, and KPS101, utilizing the following USEPA SW-846 Methods:

- Method 8260B for VOCs (Benzene, Chlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene and 1,4-Dichlorobenzene)
- Method 6010C for total and dissolved iron and manganese

Samples were also analyzed for MNA parameters by the following methods:

- Method RSK-175 for Dissolved Gasses (Ethane, Ethylene, and Methane)
- USEPA Method 310.1 for Alkalinity and Free Carbon Dioxide
- USEPA Method 325.2 for Chloride
- USEPA Method 353.2 for Nitrogen, Nitrate
- USEPA Method 375.4 for Sulfate
- USEPA Method 415.1 for Total and Dissolved Organic Carbon

Samples were reviewed following procedures outlined in the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (USEPA 2008), USEPA Contract Laboratory Program National Functional Guidelines for Superfund Inorganic Data



Review (USEPA 2010) and the Revised Long-Term Monitoring Program (LTMP) Work Plan (Solutia 2009).

The above guidelines provided the data review criteria. Additional quantitative criteria are given in the analytical methods. Qualifiers assigned by the data reviewer have been applied to the laboratory report. The qualifiers indicate data that did not meet acceptance criteria and corrective actions were not successful or not performed. The various qualifiers are explained in **Tables 1** and **2** below.

**TABLE 1 Laboratory Data Qualifiers** 

Lab Qualifier	Definition
U	Analyte was not detected at or above the reporting limit.
*	LCS, LCSD, MS, MSD, MD or surrogate exceeds the control limits.
Е	Result exceeded the calibration range, secondary dilution required.
	Surrogate or matrix spike recoveries were not obtained because the extract was
D	diluted for analysis; also compounds analyzed at a dilution will be flagged with a
	D.
J	Result is less than the RL but greater than or equal to the MDL and the
3	concentration is an approximate value.
Х	Spike recovery exceeds upper or lower control limits.
F	MS, MSD or RPD exceeds upper or lower control limits.
Р	The difference between the results of the two GC columns is greater than 40%
Н	Sample was prepped or analyzed beyond the specified holding time.
В	Compound was found in the blank and sample.
4	MS, MSD: The analyte present in the original sample is 4 times greater than the
4	matrix spike concentration; therefore, control limits are not applicable.
٨	ICV, CCV, ICB, CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument
,	related QC exceeds the control limits.



#### **TABLE 2 URS Data Qualifiers**

	Definition
U	The analyte was analyzed for but was not detected.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit.  However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Based on the criteria outlined, it is recommended that the results reported for these analyses are accepted for their intended use. Acceptable levels of accuracy, precision, and representativeness (based on MS/MSD, LCS, surrogate compounds and field duplicate results) were achieved for this data set, except where noted in this report.

The data review included evaluation of the following criteria:

#### **Organics**

- Receipt condition and sample holding times
- Laboratory method blanks, field equipment blanks and trip blank samples
- Surrogate spike recoveries
- Laboratory control sample (LCS) recoveries
- Matrix spike/matrix spike duplicate (MS/MSD) sample recoveries and relative percent difference (RPD) values
- Field duplicate results
- Results reported from dilutions
- Internal standard (IS) recoveries

#### **Inorganics/General chemistry**

- · Receipt condition and sample holding times
- Laboratory method blank and field equipment blank samples
- Laboratory control sample (LCS) recoveries



- Matrix spike/matrix spike duplicate (MS/MSD) sample recoveries and matrix duplicate relative percent difference (RPD) values
- Field duplicate and laboratory duplicate results
- Results reported from dilutions

The following sections present the results of the data review.

#### 2.0 RECEIPT CONDITION AND SAMPLE HOLDING TIMES

Sample holding time requirements for the analyses performed are presented in the methods and/or in the data review guidelines. Review of the sample collection, extraction and analysis dates involved comparing the chain-of-custody and the laboratory data summary forms for accuracy, consistency, and holding time compliance.

The cooler receipt forms for SDGs KPS097, KPS099, and KPS100 indicated that coolers were received by the laboratory at temperatures below the 4°C ± 2°C criteria. The samples were received in good condition; therefore no qualification of data was required.

The receipt forms for SDGs KPS097, KPS098, KPS099, indicated pH > 2 for total organic carbon, dissolved organic carbon, total metals, and/or dissolved metals in several samples; please see section 10.0 of this report for qualifications.

Additionally, two out of three VOA vials for samples BSA-MW-2D-1113 and CPA-MW-3D-1113 were received by the laboratory with headspace. The remaining vials without headspace contained sufficient sample to complete all requested analyses; therefore no qualification of data was required. Additionally, the laboratory indicated that the container identification information for sample BSA-MW-1S-1113 did not match the COC. URS contacted the laboratory; data were reported using the correct COC-designated sample IDs.

#### 3.0 TRIP BLANKS, LABORATORY METHOD BLANK AND EQUIPMENT BLANK SAMPLES

Trip blank samples are used to assess VOC cross contamination of samples during shipment to the laboratory. Trip blanks were submitted with each cooler shipped containing VOC samples for a total of six trip blank sample sets. Trip blank results were non-detect.

Laboratory method blank samples evaluate the existence and magnitude of contamination problems resulting from laboratory activities. Laboratory method blank samples were analyzed at the method prescribed frequencies. Method blank results were non-detect.

Equipment blank samples are used to assess the effectiveness of equipment decontamination procedures. The equipment blank results were non-detect, except as summarized in the table below.



Blank ID	Parameter	Analyte	Concentration/Amount
CPA-MW-1D-1113-EB	VOCs	Benzene	20 ug/L
CPA-MW-1D-1113-EB	VOCs	Chlorobenzene	9.8 ug/L
CPA-MW-1D-1113-EB	VOCs	1,4-Dichlorobenzene	10 ug/L
BSA-MW-2D-EB	VOCs	Benzene	9.1 ug/L
BSA-MW-2D-EB	VOCs	Chlorobenzene	4.1 ug/L
BSA-MW-2D-EB	VOCs	1,2-Dichlorobenzene	5.1 ug/L
BSA-MW-2D-EB	VOCs	1,4-Dichlorobenzene	5.9 ug/L

Qualifications due to blank contamination are included in the table below. Due to the uncertainty of potential carryover, detections for benzene associated with CPA-MW-1D-1113-EB were qualified as estimated. Analytical data that were reported non-detect or at concentrations greater than five times (5X) the associated blank concentration did not required qualification.

Sample ID	Parameter	Analyte	New Reporting Limit (RL)	Qualification
BSA-MW-3D-1113	VOCs	Benzene	-	J

#### 4.0 SURROGATE SPIKE RECOVERIES

Surrogate compounds are used to evaluate overall laboratory performance for sample preparation efficiency on a per sample basis. VOC samples were spiked with surrogate compounds during sample preparation. USEPA National Functional Guidelines for Superfund Organic Methods Data Review state how data is qualified, if surrogate spike recoveries do not meet acceptance criteria. Surrogate spike recoveries were within evaluation criteria.

#### 5.0 LABORATORY CONTROL SAMPLE RECOVERIES

Groundwater laboratory control samples (LCS) were analyzed with each analytical batch to assess the accuracy of the analytical process. LCS recoveries were within evaluation criteria, except as summarized in the table below.

LCS/LCSD ID	Parameter	Analyte	LCS/LCSD Recovery	RPD	LCS/LCSD/ RPD Criteria
LCS/LCSD 680-304581/4/5	VOCs	1,2-Dichlorobenzene	76/79	4	77-124/30

Analytical data that required qualification based on LCS data are included in the table below.

Sample ID	Parameter	Analyte	Qualification
ESL-MW-D1-1113	VOCs	1,2-Dichlorobenzene	UJ



#### 6.0 MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) SAMPLES

MS/MSD samples are analyzed to assess the accuracy and precision of the analytical process on an analytical sample in a particular matrix. MS/MSD samples were collected at a frequency of one per 20 investigative samples in accordance with the work plan. URS Corporation submitted one MS/MSD sample set for 20 investigative samples, which met the work plan frequency requirement. The laboratory spiked and analyzed groundwater sample BSA-MW-5D-1113 for VOCs. Although not requested for MS/MSD analyses, the laboratory spiked groundwater samples CPA-MW-5D-F(0.2)-1113, BSA-MW-1S-1113, BSA-MW-2D-1113, GWE-5D-1113, and ESL-MW-A-1113 for various parameters as discussed further in the data review in **Appendix D**.

USEPA National Functional Guidelines for Organic Data Review indicates that organic data does not require qualification based on MS/MSD data alone. Therefore, if recoveries were outside evaluation criteria due to matrix interference or abundance of analytes, no qualifiers were assigned unless these analytes had other quality control criteria outside evaluation criteria. MS/MSD recoveries outside evaluation criteria are summarized in the table below.

Groundwater samples spiked and analyzed as MS/MSDs and their respective recoveries were within evaluation criteria with the exceptions summarized in the following table.

MS/MSD ID	Parameter	Analyte	MS/MSD Recovery	RPD	MS/MSD/ RPD Criteria
BSA-MW-5D-1113	VOCs	Chlorobenzene	88/ <b>78</b>	4	79-120/30
BSA-MW-1S-1113	General chemistry	Sulfate	44/52	17	75-125/30
ESL-MW-A-1113	General chemistry	Nitrate	110/ <b>111</b>	1	90-110/10

Analytical data that required qualification based on MS/MSD data are included in the table below. USEPA National Functional Guidelines for Organic Data Review indicates that organic data does not require qualification based on MS/MSD data alone. Analytical data reported as non-detect and associated with MS/MSD recoveries above evaluation criteria, indicating a possible high bias, did not require qualification.

Sample ID	Parameter	Analyte	Qualification
BSA-MW-1S-1113	General chemistry	Sulfate	UJ

#### 7.0 FIELD DUPLICATE RESULTS

Field duplicate results are used to evaluate precision of the entire data collection activity, including sampling, analysis and site heterogeneity. When results for both duplicate and sample values are greater than five times the practical quantitation limit (PQL), satisfactory precision is indicated by an RPD less than or equal to 25 percent for aqueous samples. Where one or both of the results



of a field duplicate pair are reported at less than five times the PQL, satisfactory precision is indicated if the field duplicate results agree within two times the quantitation limit. Field duplicate results that do not meet these criteria may indicate unsatisfactory precision of the results.

Two pairs of field duplicate samples were collected for the seventeen investigative groundwater samples. This satisfies the requirement in the work plan (one per ten investigative samples or ten percent). Groundwater field duplicate RPDs were within evaluation criteria. No qualification of data was required.

#### 8.0 INTERNAL STANDARD RESPONSES

Internal standard (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during each analytical run. IS areas must be within -50 percent to +100 percent for VOCs. The internal standards area responses for VOCs were verified for the data review. VOC IS responses met the criteria as described above for groundwater samples. No qualification of data was required.

#### 9.0 RESULTS REPORTED FROM DILUTIONS

VOC, chloride, and sulfate results for groundwater samples were diluted due to high levels of target analytes. The diluted sample results for these analytes were reported for the associated samples.

#### 10.0 ADDITIONAL QUALIFICATIONS

The following samples are qualified, as summarized below, due to pH > 2.

Sample ID	Parameter	Analyte	Qualification
CPA-MW-4D-1113	General chemistry	Total organic carbon	J
BSA-MW-5D-1113	General chemistry	Total organic carbon	J
BSA-MW-1S-F(0.2)-1113	General chemistry	Dissolved organic carbon	J
CPA-MW-1D-F(0.2)-1113	General chemistry	Dissolved organic carbon	J
BSA-MW-2D-1113	Total metals	Iron	J
BSA-MW-2D-1113	Total metals	Manganese	J
BSA-MW-2D-1113	General chemistry	Total organic carbon	J
BSA-MW-2D-F(0.2)-1113	Dissolved metals	Iron	J
BSA-MW-2D-F(0.2)-1113	Dissolved metals	Manganese	J
BSA-MW-2D-F(0.2)-1113	General chemistry	Dissolved organic carbon	J
CPA-MW-3D-1113	Total metals	Iron	J
CPA-MW-3D-1113	Total metals	Manganese	J
CPA-MW-3D-F(0.2)-1113	Dissolved metals	Iron	J
CPA-MW-3D-F(0.2)-1113	Dissolved metals	Manganese	J
CPA-MW-3D-F(0.2)-1113	General chemistry	Dissolved organic carbon	J



# Appendix D Groundwater Analytical Results (with Data Review Reports)

# Solutia Krummrich Data Review WGK LTM 4Q13

**Laboratory SDG: KPS097** 

Data Reviewer: Melissa Mansker Peer Reviewer: Elizabeth Kunkel

**Date Reviewed: 12/4/2013** 

Guidance: USEPA National Functional Guidelines for Superfund Organic Methods Data Review 2008. USEPA National Functional Guidelines for Superfund

**Inorganic Data Review 2010** 

Work Plan: Revised Long-Term Monitoring Program (LTMP) Work Plan (Solutia

2009)

Sample Identification					
BSA-MW-4D-1113	BSA-MW-4D-F(0.2)-1113				
CPA-MW-4D-1113	CPA-MW-4D-F(0.2)-1113				
BSA-MW-5D-1113	BSA-MW-5D-F(0.2)-1113				
CPA-MW-5D-1113	CPA-MW-5D-F(0.2)-1113				
4Q13 LTM Trip Blank #1					

#### 1.0 Data Package Completeness

Were all items delivered as specified in the QAPP and COC as appropriate?

Yes

#### 2.0 Laboratory Case Narrative \ Cooler Receipt Form

Were problems noted in the laboratory case narrative or cooler receipt form?

Yes, the laboratory case narrative indicated chlorobenzene MS/MSD recoveries were outside evaluation criteria for sample BSA-MW-5D-1113. Dissolved iron MS/MSD recoveries in sample CPA-MW-5D-F(0.2)-1113 could not be evaluated because the sample concentrations were greater than four times (4X) the matrix spike concentration. Samples were diluted due to high levels of target analytes. These issues are addressed further in the appropriate sections below.

The cooler receipt form indicated that one of one coolers was received by the laboratory at a temperature of  $1.4^{\circ}$ C which is outside the  $4^{\circ}$ C  $\pm$   $2^{\circ}$ C criteria. The samples were received in good condition; therefore no qualification of data was required. The pH for total organic carbon in samples CPA-MW-4D-1113 and BSA-MW-5D-1113 was out of range upon receipt; please see section 11.0 of this review for qualifications.

#### 3.0 Holding Times

Were samples extracted/analyzed within applicable limits?

Yes

#### 4.0 Blank Contamination

Were any analytes detected in the Method Blanks, Field Blanks or Trip Blanks?

No

#### 5.0 Laboratory Control Sample

Were LCS recoveries within evaluation criteria?

Yes

#### 6.0 Surrogate Recoveries

Were surrogate recoveries within evaluation criteria?

Yes

#### 7.0 Matrix Spike and Matrix Spike Duplicate Recoveries

Were MS/MSD samples collected as part of this SDG?

Yes, sample BSA-MW-5D-1113 was spiked and analyzed for VOCs. Although not requested, sample CPA-MW-5D-F(0.2)-1113 was spiked and analyzed for dissolved metals.

Were MS/MSD recoveries within evaluation criteria?

No

MS/MSD ID	Parameter	Analyte	MS/MSD Recovery	RPD	MS/MSD/ RPD Criteria	
BSA-MW-5D-1113	VOCs	Chlorobenzene	88/ <b>78</b>	4	79-120/30	

USEPA National Functional Guidelines for Organic Data Review indicates that organic data does not require qualification based on MS/MSD data alone and LCS recoveries were within evaluation criteria. Dissolved iron MS/MSD recoveries in sample CPA-MW-5D-F(0.2)-1113 could not be evaluated because the sample concentrations were greater than four times (4X) the matrix spike concentration. No qualification of data was required.

#### 8.0 Internal Standard (IS) Recoveries

Were internal standard area recoveries within evaluation criteria?

Yes

#### 9.0 Laboratory Duplicate Results

Were laboratory duplicate samples collected as part of this SDG?

Yes, sample BSA-MW-4D-1113 was duplicated and analyzed for alkalinity and chloride. Sample BSA-MW-5D-1113 was duplicated and analyzed for chloride and nitrate. Sample BSA-MW-5D-F(0.2)-1113 was duplicated and analyzed for dissolved organic carbon.

Were laboratory duplicate sample RPDs within criteria?

Yes

#### 10.0 Field Duplicate Results

Were field duplicate samples collected as part of this SDG? No

### 10.0 Sample Dilutions

For samples that were diluted and nondetect, were undiluted results also reported? Not applicable; analytes were detected in samples that were diluted.

#### 11.0 Additional Qualifications

Were additional qualifications applied?

Yes, the following samples are qualified, as summarized below, due to pH >2.

Sample ID	Parameter	Analyte	Qualification
CPA-MW-4D-1113	General chemistry	Total organic carbon	J
BSA-MW-5D-1113	General chemistry	Total organic carbon	J

#### SDG KPS097

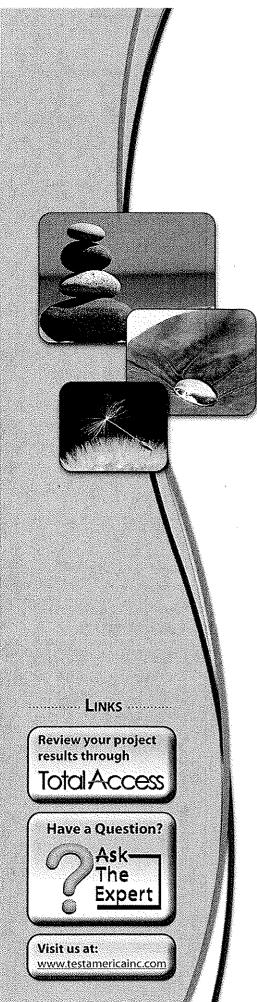
**Results of Samples from Monitoring Wells:** 

BSA-MW-4D

BSA-MW-5D

CPA-MW-4D

CPA-MW-5D



# **TestAmerica**

THE LEADER IN ENVIRONMENTAL TESTING

## **ANALYTICAL REPORT**

TestAmerica Laboratories, Inc. TestAmerica Savannah 5102 LaRoche Avenue Savannah, GA 31404 Tel: (912)354-7858

TestAmerica Job ID: 680-95803-1

TestAmerica Sample Delivery Group: KPS097

Client Project/Site: WGK Long Term Monitoring - 4Q13 NOV

2013

For:

Solutia Inc. 575 Maryville Centre Dr. Saint Louis, Missouri 63141

Attn: Mr. Jerry Rinaldi

Michele Kkusez

Authorized for release by: 11/22/2013 11:16:48 AM

Michele Kersey, Project Manager I (912)354-7858 michele.kersey@testamericainc.com

DEC 0 4 2013

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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#### **Case Narrative**

Client: Solutia Inc.
Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95803-1
SDG: KPS097

Job ID: 680-95803-1

Laboratory: TestAmerica Savannah

#### **CASE NARRATIVE**

Client: Solutia Inc.

Project: WGK Long Term Monitoring - 4Q13 NOV 2013

Report Number: 680-95803-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

#### RECEIPT

Narrative

The samples were received on 11/5/2013 9:52 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.4° C.

#### Except:

Method(s) 415.1: The following sample(s) were collected in properly preserved vials, however, the pH was outside the required criteria when verified by the laboratory: BSA-MW-5D-1113 (680-95803-5), CPA-MW-4D-1113 (680-95803-3).

#### **VOLATILE ORGANIC COMPOUNDS (GC-MS)**

Samples BSA-MW-4D-1113 (680-95803-1), CPA-MW-4D-1113 (680-95803-3), BSA-MW-5D-1113 (680-95803-5), CPA-MW-5D-1113 (680-95803-7) and 4Q13 LTM Trip Blank #1 (680-95803-9) were analyzed for Volatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 11/13/2013.

The matrix spike duplicate (MSD) recoveries for batch 303240 were outside control limits. The associated laboratory control sample (LCS) recovery met acceptance criteria.

Refer to the QC report for details.

Samples BSA-MW-4D-1113 (680-95803-1)[25X], CPA-MW-4D-1113 (680-95803-3)[2X], BSA-MW-5D-1113 (680-95803-5)[5X] and CPA-MW-5D-1113 (680-95803-7)[20X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No other difficulties were encountered during the volatiles analysis.

All other quality control parameters were within the acceptance limits.

#### **DISSOLVED GASES**

Samples BSA-MW-4D-1113 (680-95803-1), CPA-MW-4D-1113 (680-95803-3), BSA-MW-5D-1113 (680-95803-5) and CPA-MW-5D-1113 (680-95803-7) were analyzed for dissolved gases in accordance with RSK-175. The samples were analyzed on 11/08/2013.

No difficulties were encountered during the dissolved gases analysis.

DEC 0 4 2013

#### **Case Narrative**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95803-1

SDG: KPS097

Job ID: 680-95803-1 (Continued)

Laboratory: TestAmerica Savannah (Continued)

All quality control parameters were within the acceptance limits.

#### METALS (ICP)

Samples BSA-MW-4D-F(0.2)-1113 (680-95803-2), CPA-MW-4D-F(0.2)-1113 (680-95803-4), BSA-MW-5D-F(0.2)-1113 (680-95803-6) and CPA-MW-5D-F(0.2)-1113 (680-95803-8) were analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 11/06/2013 and analyzed on 11/07/2013.

Due to the high concentration of iron, the matrix spike / matrix spike duplicate (MS/MSD) for batch 680-302028 could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria.

No difficulties were encountered during the metals analysis.

All qualify control parameters were within the acceptance limits.

#### METALS (ICP)

Samples BSA-MW-4D-1113 (680-95803-1), CPA-MW-4D-1113 (680-95803-3), BSA-MW-5D-1113 (680-95803-5) and CPA-MW-5D-1113 (680-95803-7) were analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 11/06/2013 and analyzed on 11/07/2013.

Due to the high concentration of iron, the matrix spike / matrix spike duplicate (MS/MSD) for batch 680-302028 could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria.

No difficulties were encountered during the metals analysis.

All quality control parameters were within the acceptance limits.

#### **ALKALINITY**

Samples BSA-MW-4D-1113 (680-95803-1), CPA-MW-4D-1113 (680-95803-3), BSA-MW-5D-1113 (680-95803-5) and CPA-MW-5D-1113 (680-95803-7) were analyzed for alkalinity in accordance with EPA Method 310.1. The samples were analyzed on 11/13/2013 and 11/14/2013.

No difficulties were encountered during the alkalinity analysis.

All quality control parameters were within the acceptance limits.

#### CHLORIDE

Samples BSA-MW-4D-1113 (680-95803-1), CPA-MW-4D-1113 (680-95803-3), BSA-MW-5D-1113 (680-95803-5) and CPA-MW-5D-1113 (680-95803-7) were analyzed for Chloride in accordance with EPA Method 325.2. The samples were analyzed on 11/11/2013 and 11/13/2013.

Samples CPA-MW-4D-1113 (680-95803-3)[5X], BSA-MW-5D-1113 (680-95803-5)[5X] and CPA-MW-5D-1113 (680-95803-7)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the chloride analysis.

All quality control parameters were within the acceptance limits.

#### NITRATE-NITRITE AS NITROGEN

Samples BSA-MW-4D-1113 (680-95803-1), CPA-MW-4D-1113 (680-95803-3), BSA-MW-5D-1113 (680-95803-5) and CPA-MW-5D-1113 (680-95803-7) were analyzed for nitrate-nitrite as nitrogen in accordance with EPA Method 353.2. The samples were analyzed on 11/05/2013.

No difficulties were encountered during the nitrate-nitrite analysis.

All quality control parameters were within the acceptance limits.

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#### **Case Narrative**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95803-1

SDG: KPS097

Job ID: 680-95803-1 (Continued)

Laboratory: TestAmerica Savannah (Continued)

#### SULFATE

Samples BSA-MW-4D-1113 (680-95803-1), CPA-MW-4D-1113 (680-95803-3), BSA-MW-5D-1113 (680-95803-5) and CPA-MW-5D-1113 (680-95803-7) were analyzed for sulfate in accordance with EPA Method 375.4. The samples were analyzed on 11/06/2013.

Samples BSA-MW-4D-1113 (680-95803-1)[10X] and CPA-MW-5D-1113 (680-95803-7)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the sulfate analysis.

All quality control parameters were within the acceptance limits.

#### **TOTAL ORGANIC CARBON**

Samples BSA-MW-4D-1113 (680-95803-1), CPA-MW-4D-1113 (680-95803-3), BSA-MW-5D-1113 (680-95803-5) and CPA-MW-5D-1113 (680-95803-7) were analyzed for total organic carbon in accordance with EPA Method 415.1. The samples were analyzed on 11/09/2013.

No difficulties were encountered during the TOC analysis.

All quality control parameters were within the acceptance limits.

#### DISSOLVED ORGANIC CARBON (DOC)

Samples BSA-MW-4D-F(0.2)-1113 (680-95803-2), CPA-MW-4D-F(0.2)-1113 (680-95803-4), BSA-MW-5D-F(0.2)-1113 (680-95803-6) and CPA-MW-5D-F(0.2)-1113 (680-95803-8) were analyzed for Dissolved Organic Carbon (DOC) in accordance with EPA Method 415.1. The samples were analyzed on 11/13/2013.

No difficulties were encountered during the DOC analysis.

All quality control parameters were within the acceptance limits.

DEC 0 4 2013

#### **Sample Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95803-1

SDG: KPS097.

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-95803-1	BSA-MW-4D-1113	Water	11/04/13 13:45	11/05/13 09:52
680-95803-2	BSA-MW-4D-F(0.2)-1113	Water	11/04/13 13:45	11/05/13 09:52
680-95803-3	CPA-MW-4D-1113	Water	11/04/13 11:50	11/05/13 09:52
680-95803-4	CPA-MW-4D-F(0.2)-1113	Water	11/04/13 11:50	11/05/13 09:52
680-95803-5	BSA-MW-5D-1113	Water	11/04/13 15:30	11/05/13 09:52
680-95803-6	BSA-MW-5D-F(0.2)-1113	Water	11/04/13 15:30	11/05/13 09:52
680-95803-7	CPA-MW-5D-1113	Water	11/04/13 10:10	11/05/13 09:52
680-95803-8	CPA-MW-5D-F(0.2)-1113	Water	11/04/13 10:10	11/05/13 09:52
680-95803-9	4Q13 LTM Trip Blank #1	Water	11/04/13 00:00	11/05/13 09:52

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TestAmerica Savannah

#### **Method Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95803-1

SDG: KPS097

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SAV
RSK-175	Dissolved Gases (GC)	RSK	TAL SAV
6010C	Metals (ICP)	SW846	TAL SAV
310,1	Alkalinity	MCAWW	TAL SAV
325.2	Chloride	MCAWW	TAL SAV
353.2	Nitrogen, Nitrate-Nitrite	MCAWW	TAL SAV
375.4	Sulfate	MCAWW	TAL SAV
415.1	тос	MCAWW	TAL SAV
415.1	DOC	MCAWW	TAL SAV

#### Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

RSK = Sample Prep And Calculations For Dissolved Gas Analysis In Water Samples Using A GC Headspace Equilibration Technique, RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Lab

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

DEC 0 4 2013

#### **Definitions/Glossary**

Client: Solutia Inc. TestAmerica Job ID: 680-95803-1 Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013 SDG: KPS097 Qualifiers GC/MS VOA Qualifier **Qualifier Description** Ũ Indicates the analyte was analyzed for but not detected. MS/MSD Recovery and/or RPD exceeds the control limits GC VOA Qualifier Qualifier Description ī Indicates the analyte was analyzed for but not detected. Metals Qualifier Qualifier Description MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable. Indicates the analyte was analyzed for but not detected. **General Chemistry** Qualifier **Qualifier Description** ίĩ Indicates the analyte was analyzed for but not detected. Glossary Abbreviation These commonly used abbreviations may or may not be present in this report. Listed under the "D" column to designate that the result is reported on a dry weight basis %R Percent Recovery CNE Contains no Free Liquid DER Duplicate error ratio (normalized absolute difference) Dil Fac Dilution Factor DL, RA, RE, IN Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample DLC Decision level concentration MDA Minimum detectable activity EDL Estimated Detection Limit MDC Minimum detectable concentration MDL Method Detection Limit ML Minimum Level (Dioxin) NC Not Calculated

ND

PQL

QC

RER

TEQ

RL RPD Not detected at the reporting limit (or MDL or EDL if shown)

Relative Percent Difference, a measure of the relative difference between two points

Reporting Limit or Requested Limit (Radiochemistry)

Practical Quantitation Limit

Toxicity Equivalent Factor (Dioxin)

Toxicity Equivalent Quotient (Dioxin)

Quality Control

Relative error ratio

DEC 0 4 2013
TestAmerica Savannah

#### **Detection Summary**

Client: Solutia Inc.

Carbon Dioxide, Free

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95803-1

Lab Sample ID: 680-95803-1

SDG: KPS097

Total/NA

Lab Sample ID: 680-95803-2

Lab Sample ID: 680-95803-3

Lab Sample ID: 680-95803-4

Lab Sample ID: 680-95803-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type	
Benzene	130		25		ug/L	25	_	8260B	Total/NA	
Chlorobenzene	2500		25		ug/L	25		8260B	Total/NA	
1,4-Dichlorobenzene	71		25		ug/L	25		8260B	Total/NA	
Ethane	3,8		1,1		ug/L	1		RSK-175	Total/NA	
Methane (TCD)	840		0.58		ug/L	1		RSK-175	Total/NA	
Iron	7.3		0.050		mg/L	1		6010C	Total	
Manganese	0.55		0.010		mg/L	1		6010C	Recoverable Total	
Chforide	94		1.0		mg/L	1		325.2	Recoverable Total/NA	
Sulfate	110		50		mg/L	10		375.4	Total/NA	
Total Organic Carbon	4.0		1.0		mg/L	1		415.1	Total/NA	
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type	
Alkatinity	480		5,0		mg/L	1		310.1	Total/NA	

#### Client Sample ID: BSA-MW-4D-F(0.2)-1113

ſ	Analyte	Result	Qualifier	RL	₩DL	Unit	Dil Fac	D	Method	Prep Type
-	fron, Dissolved	7.0		0.050		mg/L	1	*****	6010C	Dissolved
	Manganese, Dissolved	0.53		0.010		mg/L	1		6010C	Dissolved
1.	Dissolved Organic Carbon	4.4		1.0		mg/L	1		415.1	Dissolved

5.0

mg/L

#### Client Sample ID: CPA-MW-4D-1113

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	47	***************************************	2.0		ug/L	2	_	8260B	Total/NA
Chlorobenzene	250		2.0		ug/L	2		8260B	Total/NA
1,2-Dichlorobenzene	5.9		2.0		ug/L	2		8260B	Total/NA
1,4-Dichlorobenzene	3.4		2.0		ug/L	2		8260B	Total/NA
Ethane	12		1.1		ug/L	1		RSK-175	Total/NA
Methane (TCD)	9800		0.58		ug/L	1		RSK-175	Total/NA
Iron	12		0.050		mg/L	1		6010C	Total
Manganese	0,30		0.010		mg/L	1		6010C	Recoverable Total
									Recoverable
Chloride	170	_	5.0		mg/L	5		325.2	Total/NA
Total Organic Carbon	7.3	J	1.0		mg/L	1		415.1	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Ргер Туре
Alkalinity	620		5.0		mg/L	1	•	310.1	Total/NA
Carbon Dioxide, Free	43		5.0		mg/L	1		310.1	Total/NA

#### Client Sample ID: CPA-MW-4D-F(0.2)-1113

Analyte	Result	Qualifier	RL	MDL	Unit	ι	Dil Fac	D	Method	Ргер Туре
Iron, Dissolved	11		0.050	*	mg/L		1		6010C	Dissolved
Manganese, Dissolved	0.29		0.010		mg/L		1		6010C	Dissolved
Dissolved Organic Carbon	8.2		1.0		mg/L		1		415,1	Dissolved

#### Client Sample ID: BSA-MW-5D-1113

This Detection Summary does not include radiochemical test results.

TestAmerica Savannah

DEC 0 4 2013

#### **Detection Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95803-1

Lab Sample ID: 680-95803-5

Lab Sample ID: 680-95803-7

Lab Sample ID: 680-95803-8

Lab Sample ID: 680-95803-9

SDG: KPS097

#### Client Sample ID: BSA-MW-5D-1113 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chlorobenzene	440		5.0		ug/L	5	*****	8260B	Total/NA
Ethane	15		1.1		ug/L	1		RSK-175	Total/NA
Methane (TCD)	13000		0.58		ug/L	1		RSK-175	Total/NA
Iron	12		0.050		mg/L	1		6010C	Total
Manganese	0.28		0.010		mg/L	1		6010C	Recoverable Total Recoverable
Chloride	290		5.0		mg/L	5		325.2	Total/NA
Total Organic Carbon	6.6	<b>J</b>	1,0		mg/L	1		415.1	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Alkalínity	640		5.0		mg/L	1		310.1	Total/NA
Carbon Dioxide, Free	49		5.0		mg/L	1		310.1	Total/NA

#### Client Sample ID: BSA-MW-5D-F(0.2)-1113

Client Sample ID: BSA-MW-5D-F(0.2)-1113 Lab Sample ID: 680-95803-6									
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron, Dissolved	12		0.050	***************************************	mg/L	1		6010C	Dissolved
Manganese, Dissolved	0.28		0.010		mg/L	1		6010C	Dissolved
Dissolved Organic Carbon	7.3		1.0		mg/L	1		415.1	Dissolved

#### Client Sample ID: CPA-MW-5D-1113

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chlorobenzene	1900		20		ug/L	20	•~-	8260B	Total/NA
Ethane	1.2		1.1		ug/L	1		RSK-175	Total/NA
Methane	130		0.58		ug/L	1		RSK-175	Total/NA
Iron	. 21		0.050		mg/L	1		6010C	Total
									Recoverable
Manganese	0.62		0.010		mg/L	1		6010C	Total
									Recoverable
Chloride	210		5.0		mg/L	5		325.2	Total/NA
Sulfate	120		50		mg/L	10		375.4	Total/NA
Total Organic Carbon	3.6		1.0		mg/L	1		415.1	Totał/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Alkalinity	550	***************************************	5.0		mg/L	1		310.1	Total/NA
Carbon Dioxide, Free	72		5,0		mg/L	1		310.1	Total/NA

#### Client Sample ID: CPA-MW-5D-F(0.2)-1113

Analyte	Result Quali	fier RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron, Dissolved	21	0.050		mg/L	1	_	6010C	Dissolved
Manganese, Dissolved	0.62	0.010		mg/L	1		6010C	Dissolved
Dissolved Organic Carbon	3.7	1.0		mg/L	1		415.1	Dissolved

#### Client Sample ID: 4Q13 LTM Trip Blank #1

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Savannah

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Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95803-1

SDG: KPS097

Client Sample ID: BSA-MW-4D-1113

Date Collected: 11/04/13 13:45 Date Received: 11/05/13 09:52 Lab Sample ID: 680-95803-1

Matrix: Water

Aπalyte	Result	Qualifier	RL	MDL.	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	130		25		ug/L		AND DESCRIPTION OF PROPERTY AND PROPERTY.	11/13/13 15:37	25
Chlorobenzene	2500		25		ug/L			11/13/13 15:37	25
1,2-Dichlorobenzene	25	U	25		ug/L			11/13/13 15:37	25
1,3-Dichlorobenzene	25	U	25		ug/L			11/13/13 15:37	25
1,4-Dichlorobenzene	71		25		ug/L			11/13/13 15:37	25
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	95		70 - 130					11/13/13 15:37	25
Dibromofluoromethane	87		70 - 130					11/13/13 15:37	25
Toluene-d8 (Surr)	96		70 - 130					11/13/13 15:37	25
Method: RSK-175 - Dissolved	I Gases (GC)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	3.8		1.1		ug/L			11/08/13 15:31	1
Ethylene	1.0	U	1.0		ug/L			11/08/13 15:31	1
Methane (TCD)	840		0.58		ug/L			11/08/13 15:31	1
Method: 6010C - Metals (ICP)	- Total Recoverat	ole							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
iron	7.3	*	0.050		mg/L	****	11/06/13 17:15	11/07/13 19:38	1
Manganese	. 0.55		0,010 ,		mg/L		11/06/13 17:15	11/07/13 19:38	1
General Chemistry									
Aπalyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	94		1,0		mg/L			11/11/13 13:00	1
	0.050	U	0.050		mg/L			11/05/13 16:46	1
Nitrate as N			50		mg/L			11/06/13 11:54	10
	110							11/09/13 19:59	
Sulfate	110 4.0		1.0		mg/L			11/09/13 19.59	1
Sulfate Total Organic Carbon	4.0	Qualifier	1.0 <b>R</b> L	RL	mg/L Unit	D	Prepared	Analyzed	1 Dil Fac
Nitrate as N Sulfate Total Organic Carbon Analyte Alkalinity	4.0	Qualifier		RL	_	D	Prepared		

DEC 0 4 2013

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95803-1

SDG: KPS097

Client Sample ID: BSA-MW-4D-F(0.2)-1113

Date Collected: 11/04/13 13:45 Date Received: 11/05/13 09:52 Lab Sample ID: 680-95803-2

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	7.0		0.050	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	mg/L		11/06/13 17:15	11/07/13 19:42	1
Manganese, Dissolved	0.53		0.010		mg/L		11/06/13 17:15	11/07/13 19:42	1
General Chemistry - Dissolved									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	4.4		1.0		mg/L			11/13/13 16:01	1

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Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95803-1

SDG: KPS097

Client Sample ID: CPA-MW-4D-1113

Date Collected: 11/04/13 11:50 Date Received: 11/05/13 09:52 Lab Sample ID: 680-95803-3

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	47	POLYNONIA BOTTOMONIA ITOMON	2.0		ug/L			11/13/13 16:07	2
Chlorobenzene	250		2.0		ug/L			11/13/13 16:07	2
1,2-Dichlorobenzene	5.9		2.0		ug/L			11/13/13 16:07	2
1,3-Dichlorobenzene	2.0	U	2.0		ug/L			11/13/13 16:07	2
1,4-Dichlorobenzene	3.4		2.0		ug/L			11/13/13 16:07	:
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fa
4-Bromofluorobenzene	111		70 - 130					11/13/13 16:07	7
Dibromofluoromethane	86		70 - 130					11/13/13 16:07	:
Toluene-d8 (Surr)	100		70 - 130					11/13/13 16:07	2
Method: RSK-175 - Dissolve	ed Gases (GC)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	12	202002002002000000000000000000000000000	1.1		ug/L			11/08/13 15:18	
Ethylene	1.0	U	1.0		ug/L			11/08/13 15:18	
Methane (TCD)	9800		0.58		ug/L			11/08/13 15:18	•
Method: 6010C - Metals (ICI	P) - Total Recoverat	ole							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Iron	12	,	0.050		mg/L		11/06/13 17:15	11/07/13 19:47	
Manganese	0.30		Q. <b>0</b> 10		mg/L		, 11/06/13 17:15	11/07/13 19:47	
General Chemistry					Unit	D	Prepared	Analyzed	Dil Fa
•	Result	Qualifier	RL	MDL					
Analyte	Result	Qualifier	FIL 5.0	MDL	mg/L		·	11/11/13 13:26	
Analyte Chloride				MDL	mg/L mg/L	***************************************		11/11/13 13:26 11/05/13 16:31	
Analyte Chloride Nitrate as N	170	U	5.0	MDL	-				
Analyte Chloride Nitrate as N Sulfate	170 0.050	U	5.0 0.050	MDL	mg/L			11/05/13 16:31	
Analyte Chloride Nitrate as N Sulfate Total Organic Carbon	170 0.050 5.0 7.3	U	5.0 0.050 5.0		mg/L mg/L	D	Prepared	11/05/13 16:31 11/06/13 11:33	
Generat Chemistry Analyte Chloride Nitrate as N Sulfate Total Organic Carbon Analyte Alkalinity	170 0.050 5.0 7.3	U J	5.0 0.050 5.0 1.0		mg/L mg/L mg/L	D	Prepared	11/05/13 16:31 11/06/13 11:33 11/09/13 20:13	Dil Fac

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95803-1

SDG: KPS097

Client Sample ID: CPA-MW-4D-F(0.2)-1113

Date Collected: 11/04/13 11:50 Date Received: 11/05/13 09:52 Lab Sample ID: 680-95803-4

Matrix: Water

Method: 6010C - Metals (ICP) - Dis-	solved								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	11		0.050	has deal tome processors come	mg/L		11/06/13 17:15	11/07/13 19:52	
Manganese, Dissolved	0.29		0.010		mg/L		11/06/13 17:15	11/07/13 19:52	1
General Chemistry - Dissolved									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	8.2		1.0	bean decourant of the second	mg/L			11/13/13 16:15	

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Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95803-1

SDG: KPS097

Client Sample ID: BSA-MW-5D-1113

Date Collected: 11/04/13 15:30 Date Received: 11/05/13 09:52 Lab Sample ID: 680-95803-5

Matrix: Water

•	anic Compounds	,							
Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Benzene	5.0	U	5.0		ug/L			11/13/13 16:36	;
Chlorobenzene	440		5.0		ug/L			11/13/13 16:36	:
1,2-Dichlorobenzene	5.0	U	5.0		ug/L			11/13/13 16:36	!
1,3-Dichlorobenzene	5.0	U	5.0		ug/L			11/13/13 16:36	
1,4-Dichlorobenzene	5.0	υ	5.0		ug/L			11/13/13 16:36	
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fa
4-Bromofluorobenzene	112		70 - 130					11/13/13 16:36	
Dibromofluoromethane	97		70 - 130					11/13/13 16:36	
Toluene-d8 (Surr)	107		70 - 130					11/13/13 16:36	
Method: RSK-175 - Dissolve	d Gases (GC)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Ethane	15	VALMINITED TO THE OWNER.	1.1		ug/L		Later of the second sec	11/08/13 15:05	
Ethylene	1.0	U	1.0		ug/L			11/08/13 15:05	
Methane (TCD)	13000		0,58		ug/L			11/08/13 15:05	
Method: 6010C - Metals (ICP	) - Total Recoverat	le							
•	•	Qualifier	D.	MDI	Unit	D	Prepared	Analyzed	
Analyte	Result	Canadillie.	RL	MDL					Dil Fa
	Result 12		0,050		mg/L		11/06/13 17:15	11/07/13 19:56	Dil Fa
Analyte Iron Manganese ,		Quantito !			mg/L mg/L		11/06/13 17:15 11/06/13 17:15	***************************************	Dil Fa
ron Manganese	12		0,050		-			11/07/13 19:56	**************
ron Manganese General Chemistry	12 0.28	Qualifier	0,050	MDL	mg/L	` D		11/07/13 19:56	Activate of the Efficient SSF common
ron Manganese General Chemistry Analyte	12 0.28		0.050 0.010		mg/L	Alarah FIVAF FITTE	11/06/13 17:15	11/07/13 19:56 11/07/13 19:56	Dil Fa
ron Manganese General Chemistry Analyte Chloride	12 0.28 Result	Qualifier	0.050 , 0.010 RL		mg/L Unit	Alarah FIVAF FITTE	11/06/13 17:15	11/07/13 19:56 11/07/13 19:56 Analyzed	Dit Fa
Manganese  General Chemistry  Analyte  Chloride  Nitrate as N	12 0.28 Result 290	Qualifier	0.050 0.010 RL 5.0		mg/L Unit mg/L	Alarah FIVAF FITTE	11/06/13 17:15	11/07/13 19:56 11/07/13 19:56 Analyzed 11/13/13 14:49	Dit Fa
ron Manganese  General Chemistry Analyte Chloride Vitrate as N Sulfate	12 0.28 Result 290 0.050	Qualifier U	0.050 0.010 RL 5.0 0.050		mg/L Unit mg/L mg/L	Alarah FIVAF FITTE	11/06/13 17:15	11/07/13 19:56 11/07/13 19:56 Analyzed 11/13/13 14:49 11/05/13 16:35	Dił Fa
ron Manganese General Chemistry Analyte Chloride Nitrate as N Sulfate Fotal Organic Carbon	12 0.28 Result 290 0.050 5.0	Qualifier U U	0.050 0.010 RL 5.0 0.050 5.0	MDL	mg/L Unit mg/L mg/L mg/L	Alarah FIVAF FITTE	11/06/13 17:15	11/07/13 19:56 11/07/13 19:56 Analyzed 11/13/13 14:49 11/05/13 16:35 11/06/13 11:33	Dil Fa
Iron	12 0.28 Result 290 0.050 5.0	Qualifier U U	0.050 0.010 RL 5.0 0.050 5.0 1.0	MDL	mg/L Unit mg/L mg/L mg/L mg/L	, D	11/06/13 17:15  Prepared	Analyzed 11/05/13 19:56  Analyzed 11/13/13 14:49 11/05/13 16:35 11/06/13 11:33 11/09/13 20:27	Actual by Abdicate to Proceed

DEC 0 4 2013.

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95803-1

SDG: KPS097

Client Sample ID: BSA-MW-5D-F(0.2)-1113

Date Collected: 11/04/13 15:30 Date Received: 11/05/13 09:52

Lab Sample ID: 680-95803-6

Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Dil Fac Analyte D Analyzed Result Qualifier RL MDL Unit Prepared 0.050 11/06/13 17:15 11/07/13 20:01 Iron, Dissolved 12 mg/L 11/07/13 20:01 Manganese, Dissolved 0.28 0.010 mg/L 11/06/13 17:15

General Chemistry - Dissolved Dil Fac Analyte Result Qualifier RL MDL Unit Prepared Analyzed 1.0 mg/L 11/13/13 17:01 Dissolved Organic Carbon 7.3

DEC 0 4 2013 TestAmerica Savannah

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95803-1

SDG: KPS097

Client Sample ID: CPA-MW-5D-1113

Date Collected: 11/04/13 10:10 Date Received: 11/05/13 09:52 Lab Sample ID: 680-95803-7

Matrix: Water

Method: 8260B - Volatile Or Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	20	U	20		ug/L			11/13/13 17:06	20
Chlorobenzene	1900		20		ug/L			11/13/13 17:06	20
1,2-Dichlorobenzene	20	U	20		ug/L			11/13/13 17:06	20
1,3-Dichlorobenzene	20	U	20		ug/L			11/13/13 17:06	20
1,4-Dichlorobenzene	20	U	20		ug/L			11/13/13 17:06	20
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	114		70 - 130					11/13/13 17:06	20
Dibromofluoromethane	92		70 - 130					11/13/13 17:06	20
Toluene-d8 (Surr)	104		70 - 130					11/13/13 17:06	20
Method: RSK-175 - Dissolve	ed Gases (GC)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	1.2		1.1		ug/L			11/08/13 14:52	1
Ethylene	1.0	U	1.0		ug/L			11/08/13 14:52	1
Methane	130		0.58		ug/L			11/08/13 14:52	1
Method: 6010C - Metals (ICI	P) - Total Recoverat	ole							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
lron	21		0.050		mg/L		11/06/13 17:15	11/07/13 20:05	1
Manganese .	0.62	3	0.010		mg/L		11/06/13 17:15	11/07/13 20:05	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL.	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	210		5.0		mg/L			11/13/13 14:49	5
Nitrate as N	0.050	ប	0.050		mg/L			11/05/13 16:34	1
Sulfate	120		50		mg/L			11/06/13 11:54	10
Total Organic Carbon	3.6		1.0		mg/L			11/09/13 20:42	1
Total Organic Carbon		Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
-	Result	Quantito							
Analyte Alkalinity	Result 550		5.0	LANGUAGE PARTIES AND ADDRESS OF THE	mg/L			11/14/13 16:50	1

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Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95803-1

SDG: KPS097

Client Sample ID: CPA-MW-5D-F(0.2)-1113

Date Collected: 11/04/13 10:10 Date Received: 11/05/13 09:52 Lab Sample ID: 680-95803-8

Matrix: Water

Method: 6010C - Metals (ICP) - Dissolv	red								
Analyte	Result	Qualifier	RL	MDL	Unit	đ	Prepared	Analyzed	Dil Fac
Iron, Dissolved	21	***************************************	0.050	,	mg/L		11/06/13 17:15	11/07/13 20:10	1
Manganese, Dissolved	0.62		0.010		mg/L		11/06/13 17:15	11/07/13 20:10	1
····									

General Chemistry - Dissolved									
Analyte	Result	Qualifier	RL	MDL	Unit	Đ	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	3.7	***************************************	1,0	***************************************	mg/L		The state of the s	11/13/13 17:28	1

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Client: Solutia Inc.

TestAmerica Job ID: 680-95803-1

SDG: KPS097

Client Sample ID: 4Q13 LTM Trip Blank #1

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

Lab Sample ID: 680-95803-9

Date Collected: 11/04/13 00:00 Date Received: 11/05/13 09:52 Matrix: Water

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1,0	U	1.0	ug/L			11/13/13 13:02	1
Chlorobenzene	1.0	U	1.0	ug/L			11/13/13 13:02	1
1,2-Dichlorobenzene	1.0	U	1.0	ug/L			11/13/13 13:02	1
1,3-Dichlorobenzene	1.0	U	1.0	ug/L			11/13/13 13:02	1
1,4-Dichlorobenzene	1.0	U	1.0	ug/L			11/13/13 13:02	1
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	112		70 - 130		•	,	11/13/13 13:02	1
Dibromofluoromethane	105		70 - 130				11/13/13 13:02	1
Toluene-d8 (Surr)	97		70 . 130				11/13/13 13:02	1

DEC 0 4 2013

# **Surrogate Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95803-1

SDG: KPS097

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water Prep Type: Total/NA

				Percent Surrog	ate Recovery (Acceptance Limits)
		BFB	DBFM	TOL	
Lab Sample ID	Client Sample iD	(70-130)	(70-130)	(70-130)	
680-95803-1	BSA-MW-4D-1113	95	87	96	
680-95803-3	CPA-MW-4D-1113	111	86	100	
880-95803-5	BSA-MW-5D-1113	112	97	107	
680-95803-5 MS	BSA-MW-5D-1113-MS	107	111	103	
680-95803-5 MSD	BSA-MW-5D-1113-MSD	93	106	99	
680-95803-7	CPA-MW-5D-1113	114	92	104	
580-95803-9	4Q13 LTM Trip Blank #1	112	105	97	
LCS 680-302958/4	Łab Control Sample	100	107	98	
LCS 680-303240/4	Łab Control Sample	106	109	101	
LCSD 680-302958/5	Lab Control Sample Dup	107	100	104	•
LCSD 680-303240/12	Lab Control Sample Dup	105	104	102	
MB 680-302958/8	Method Blank	108	106	92	
MB 680-303240/8	Method Blank	92	107	90	

BFB = 4-Bromofluorobenzene

DBFM = Dibromofluoromethane

TOL = Toluene-d8 (Surr)

DEC 0 4 2013

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95803-1

SDG: KPS097

#### Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 680-302958/8

Matrix: Water

Client Sample ID: Method Blank
Prep Type: Total/NA

Analysis Batch: 302958

,	мв	мв							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	Ų	1.0		ug/L			11/13/13 12:33	1
Chlorobenzene	1.0	U	1.0		ug/L			11/13/13 12:33	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			11/13/13 12:33	1
1,3-Dichlorobenzene	1.0	Ų	1.0		ug/L			11/13/13 12:33	1
1,4-Dichlorobenzene	1.0	U	1.0		ug/L			11/13/13 12:33	1
	МВ	мв							

	MB	MB					- 8
Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac	9
4-Bromofluorobenzene	108		70 - 130	No commence in the conditional design of the Conditional Condition	11/13/13 12:33	1	
Dibromofluoromethane	106		70 - 130		11/13/13 12:33	1	200
Toluene-d8 (Surr)	92		70 ~ 130		11/13/13 12:33	1	

Lab Sample ID: LCS 680-302958/4

Matrix: Water

Analysis Batch: 302958

Client Sample ID: Lab Control Sample	
Prep Type: Total/NA	

Analysis Duton: 002000								
		Spike	LCS	LCS				%Rec.
Analyte		Added	Result	Qualifier	Unit	D	%Rec	Limits
Benzene		50.0	48.4		ug/L		97	74 - 123
Chiorobenzene		50.0	55.7		ug/L		111	79 - 120
1,2-Dichlorobenzene	•	50.0	46.9		ug/L		94	77 - 124
1,3-Dichlorobenzene		50,0	49.5		ug/L		99	79 - 123
1,4-Dichlorobenzene		50.0	48.7		ug/L		97	76 - 124

	LCS	LCS	
Surrogate	%Recovery	Qualifier	Limits
4-Bromofluorobenzene	100	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	70 - 130
Dibromofluoromethane	107		70 - 130
Toluene-d8 (Surr)	98		70 - 130

Lab Sample ID: LCSD 680-302958/5

Matrix: Water

Analysis Batch: 302958

Client Sample ID: Lab	Control Sample Dup
	Prep Type: Total/NA

	Spike	LCSD	LCSD		%Rec.		RPD
Analyte	Added	Result	Qualifier Unit	D %F	Rec Limits	RPD	Limit
Benzene	50.0	49.4	ug/L		99 74 - 123	2	30
Chlorobenzene	50.0	56.1	ug/L		112 79 - 120	1	30
1,2-Dichlorobenzene	50.0	54,0	ug/L		108 77 - 124	14	30
1,3-Dichlorobenzene	50.0	55.7	ug/L		111 79 - 123	12	30
1,4-Dichlorobenzene	50.0	53,9	ug/L		108 76 - 124	10	30

	LCSD	LCSD	
Surrogate	%Recovery	Qualifier	Limits
4-Bromofluorobenzene	107		70 - 130
Dibromofluoromethane	100		70 - 130
Toluene-d8 (Surr)	104		70 - 130

DEC 0 4 2013

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95803-1

SDG: KPS097

#### Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-303240/8

Matrix: Water

Analysis Batch: 303240

CI	ient Sample ID: Method Blank
	Pren Tyne: Total/NA

	MB	MB							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	υ	1.0		ug/L			11/14/13 15:28	1
Chlorobenzene	1.0	υ	1.0		ug/L			11/14/13 15:28	1
1,2-Dichtorobenzene	1.0	U	1.0		ug/L			11/14/13 15:28	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			11/14/13 15:28	1
1,4-Dichlorobenzene	1.0	U	1.0		ug/L			11/14/13 15:28	1

f 7 1	МВ	МВ				
Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	92		70 - 130		11/14/13 15:28	1
Dibromofluoromethane	107		70 - 130		11/14/13 15:28	1
Toluene-d8 (Surr)	90		70 - 130		11/14/13 15:28	1

Lab Sample ID: LCS 680-303240/4

Matrix: Water

Analysis Batch: 303240

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

1		Spike	LCS	LCS				%Rec.	
	Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
-	Benzene	50.0	45.1		ug/L		90	74 - 123	***************************************
	Chlorobenzene	50.0	55.6		ug/L		111	79 - 120	
	1,2-Dichlorobenzene	50.0	59.1		ug/L		· 118	77 - 124	
-	1,3-Dichlorobenzene	50.0	59,8		ug/L		120	79 - 123	
	1,4-Dichlorobenzene	50.0	60.8		ug/L		122	76 - 124	
1									

LCG	LUJ	
%Recovery	Qualifier	Limits
106		70 - 130
109		70 - 130
101		70 - 130
	%Recovery 106 109	109

Lab Sample ID: LCSD 680-303240/12

Matrix: Water

Analysis Batch: 303240

Citent Sample ID: Lab	Control Sample Dup
	Prep Type: Total/NA

,	Spike	LCSD	LCSD				%Rec.		RPD	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit	
Benzene	50,0	43.4		ug/L		87	74 - 123	4	30	
Chlorobenzene	50.0	53.7		ug/L		107	79 - 120	3	30	
1,2-Dichlorobenzene	50.0	58.0		ug/L		116	77 - 124	2	30	
1,3-Dichlorobenzene	50.0	59.5		ug/L		119	79 - 123	1	30	
1,4-Dichlorobenzene	50.0	59.6		ug/L		119	76 - 124	2	30	
1,4-Dichioropenzene	30.0	39.0		ugrL		115	10-124	2	70	

	LCSD	LCSD	
Surrogate	%Recovery	Qualifier	Limits
4-Bromofluorobenzene	105		70 - 130
Dibromofluoromethane	104		70 - 130
Toluene-d8 (Surr)	102		70 - 130

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Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95803-1

SDG: KPS097

#### Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

5.0 U

5.0 U

Lab Sample ID: 680-95803-5 MS

Matrix: Water

1,3-Dichlorobenzene

Analysis Batch: 303240

Client Sample ID: BSA-MW-5D-1113-MS Prep Type: Total/NA

79 - 123

76 - 124

Sample Sample Spike MS MS %Rec. Qualifier %Rec Limits Analyte Result Qualifier Added Result Unit Benzene 5.0 250 230 ug/L 91 74 - 123 ug/L 250 656 88 79 - 120 Chlorobenzene 440 77 - 124 250 291 ug/L 115 1,2-Dichlorobenzene 5.0 U

292

294

255

ug/L

ug/L

ug/L

250

1,4-Dichlorobenzene 5.0 U 250 MS MS Surrogate %Recovery Qualifier Limits 4-Bromofluorobenzene 107 70 - 130 70 - 130 Dibromofluoromethane 111 Toluene-d8 (Surr) 103 70 - 130

Client Sample ID: BSA-MW-5D-1113-MSD

76 - 124

101

117

116

Prep Type: Total/NA

14

30

Matrix: Water Analysis Batch: 303240

1,4-Dichlorobenzene

Lab Sample ID: 680-95803-5 MSD

%Rec. RPD MSD MSD Sample Sample Spike %Rec Limits RPD Limit Analyte Result Qualifier Added Result Qualifier Unit n 74 123 6 30 Benzene 5.0 U 250 217 ug/L 86 250 632 F ug/L 78 79.120 4 30 Chlorobenzene 440 98 77 - 124 15 30 5.0 U 250 250 ug/L 1.2-Dichlorobenzene 5.0 U 101 79 - 123 30 250 253 ug/L 14 1.3-Dichlorobenzene

250

MSD MSD Limits Surrogate %Recovery Qualifier 70.130 4-Bromofluorobenzene 93 Dibromofluoromethane 106 70 - 130 Toluene-d8 (Surr) 99 70 - 130

Method: RSK-175 - Dissolved Gases (GC)

Client Sample ID: Method Blank Lab Sample ID: MB 680-302324/3 Prep Type: Total/NA Matrix: Water

Analysis Batch: 302324

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Dil Fac Analyte Result Qualifier RL MDL Unit D Prepared Analyzed Ethane 1.1 U 1.1 ug/L 11/08/13 11:43 11/08/13 11:43 Ethylene 1.0 U 1.0 ug/L 0.58 11/08/13 11:43 0.58 U ug/L Methane 11/08/13 11:43 0.58 U 0.58 Methane (TCD) ug/L

Client Sample ID: Lab Control Sample Lab Sample ID: LCS 680-302324/10 Matrix: Water Prep Type: Total/NA

Analysis Batch: 302324

Spike LCS LCS %Rec. Qualifier Unit %Rec Limits Analyte Added Result 100 75 - 125 Methane (TCD) 1920 1920 ug/L

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Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95803-1

SDG: KPS097

Prep Type: Total/NA

Lab Sample ID: LCS 680-302324/8

Matrix: Water

Analysis Batch: 302324

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

•			Spike	LCS	LCS				%Rec.	
	Analyte		Added	Result	Qualifier	Unit	D	%Rec	Limits	
	Ethane	MODEOL POMERO SOUTOUR PROVINCE COMMONTE	 288	263		ug/L		91	75 - 125	
	Ethylene		269	227		ug/L		84	75 - 125	
	Methane		154	136		ug/L		88	75 . 125	

Lab Sample ID: LCSD 680-302324/11

Matrix: Water

Analysis Batch: 302324									
	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Methane (TCD)	1920	1900		ua/L		99	75 - 125	1	30

Lab Sample ID: LCSD 680-302324/9

Matrix: Water

Analysis Batch: 302324

Client Sample ID: Lab	Cont	trol Sa	ımpl	e Dup
	_	_	_	

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

•	Spike	LCSD	LCSD			%Rec.		RPD
Analyte	Added	Result	Qualifier Uni			Limits	RPD	Limit
Ethane	288	307	ug/	L	106	75 - 125	16	30
Ethylene	269	293	ug/	L	109	75 - 125	25	30
Methane	154	154	ug/	Ĺ	100	75 - 125	13	30
See a see a see a see a see a see a see a see a see a see a see a see a see a see a see a see a see a see a se		4		*				`

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-302028/1-A

Matrix: Water

Analysis Batch: 302301

Client Sample ID: Method Blank
Prep Type: Total Recoverable

Prep Batch: 302028

	MB	MB							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	0.050	Ū	0.050		mg/L		11/06/13 17:15	11/07/13 19:29	1
fron, Dissolved	0.050	U	0.050		mg/L		11/06/13 17:15	11/07/13 19:29	1
Manganese	0.010	U	0.010		mg/L		11/06/13 17:15	11/07/13 19:29	1
Manganese, Dissolved	0.010	U	0.010		mg/L		11/06/13 17:15	11/07/13 19:29	1

Lab Sample ID: LCS 680-302028/2-A

Matrix: Water

Analysis Batch: 302301

Client	Sample	ID:	Lab	Control	Sample

Prep Type: Total Recoverable Prep Batch: 302028

-	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	Đ	%Rec	Limits	
fron	5.00	4.96		mg/L		99	75 - 125	 
Iron, Dissolved	5.00	4.96		mg/L		99	75 - 125	
Manganese	0.500	0.506		mg/L		101	75 - 125	
Manganese, Dissolved	0,500	0.506		mg/L		101	75 - 125	

Lab Sample ID: 680-95803-8 MS

Matrix: Water

Client Sample	ID: CP	A-MW-50	LE(0.2)-1113

Prep Type: Dissolved

1	Analysis Batch: 302301									Prep	Batch:	302028
	-	Sample	Sample	Spike	MS	MS				%Rec.		
-	Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits		
	Iron	21		5.00	25.7	4	mg/L	_	99	75 - 125	***************************************	** ************************************
	Iron, Dissolved	21		5.00	25.7	4	mg/L		99	75 - 125		
:												

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Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95803-1

Client Sample ID: Method Blank

Client Sample ID: BSA-MW-4D-1113

SDG: KPS097

Method: 6010C - Metals	(ICP)	(Continued)
------------------------	-------	-------------

Lab Sample ID: 680-95803-8 MS						CI	lient S	Sar	nple ID:	CPA-MW-	5D-F(0.2)-1113
Matrix: Water										Prep Ty	/pe: Dissolved
Analysis Batch: 302301										Prep	Batch: 302028
	Sample	Sample	Spike	MS	MS					%Rec.	
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit		D	%Rec	Limits	
Manganese	0.62		0.500	1,12		mg/L		****	102	75 - 125	
Manganese Dissolved	0.62		0.500	1 12		moti			102	75 125	

Lab Sample ID: 680-95803-8 MS Matrix: Water Analysis Batch: 302301	D					С	lient Sar	nple ID	: CPA-MW-5 Prep Ty Prep I	•	solved
	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Iron	21	h	5.00	26.4	4	mg/L		112	75 - 125	3	20
Iron, Díssolved	21		5.00	26.4	4	mg/L		112	75 - 125	3	20
Manganese	0.62		0.500	1.16		mg/L		108	75 - 125	3	20
Manganese, Dissolved	0.62		0.500	1.16		mg/L		108	75 - 125	3	20

#### Method: 310.1 - Alkalinity

Lab Sample ID: MB 680-303062/5

Lab Sample ID: 680-95803-1 DU

Matrix: Water Analysis Batch: 303062								Prep Type: 1	Totai/NA
	MB	MB							
Analyte	Result	Qualifier	` RL	RL	Unit	Ď	Prepared	Analyzed	Dil Fac
Alkalinity	5.0	U	5,0	No.	mg/L			11/13/13 11:16	1
Carbon Dioxide Free	5.0	13	5.0		ma/L			11/13/13 11:16	1

Lab Sample ID: LCS 680-303062/6	Client Sample ID: Lab Control Sample								
Matrix: Water							Prep T	ype: Total/NA	¥.
Analysis Batch: 303062									
	Spike	LCS	LCS				%Rec.		
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits		
Alkalinity	250	210		mg/L		84	80 - 120	book and the second	-

Lab Sample ID: LCSD 680-303062/32 Matrix: Water				Clie	ent Sam	ple ID:	Lab Contro Prep T	l Sampl	•
Analysis Batch: 303062								,,	
	Spike	LC\$D	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Alkalinity	250	229		mg/L		92	80 - 120	9	30

Matrix: Water							Prep T	ype: To	tal/NA
Analysis Batch: 303062									
	Sample	Sample	DU	ĐU					RPD
Analyte	Result	Qualifier	Result	Qualifier	Unit	D		RPD	Limit
Alkalinity	460		511	,,	mg/L		b bb banda banda and banda	6	30
Carbon Dioxide, Free	30		30,9		mg/L			2	30

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DEC 0 4 22 3 MM

Client: Solutia Inc. Project/Site: WGK Long Term Monitor	ing - 4Q1:	3 N	OV 2013								•	TestAme	erica Job ID: 680 SDG	0-95803-1 5: KPS097
Method: 310.1 - Alkalinity (Con	itinued)													
Lab Sample ID: MB 680-303380/5												Client S	Sample ID: Meth	od Blank
Matrix: Water													Prep Type:	Total/NA
Analysis Batch: 303380														
			MB								_			
Analyte			Qualifier		RL		RL	Unit	~~~~~~~	D 	P	repared	Analyzed	Dil Fac
Atkalinity		5.0			5.0			mg/L					11/14/13 14:47	
Carbon Dioxide, Free		5.0	U		5.0			mg/L					11/14/13 14:47	1
Lab Sample ID: LCS 680-303380/6										С	lient	Sample	e ID: Lab Contro	ol Sample
Matrix: Water										_			Prep Type:	-
Analysis Batch: 303380														
-				Spike		LCS	LCS						%Rec.	
Analyte				Added		Result	Qua	lifier	Unit		D	%Rec	Limits	
Alkalinity				250	~	224		^\	mg/L			90	80 . 120	
	_										_			
Lab Sample ID: LCSD 680-303380/3	2								CI	ient	San	nple ID:	Lab Control Sa	
Matrix: Water													Prep Type:	Total/NA
Analysis Batch: 303380				Spike		LCSD	1.00	n.					%Rec.	RPD
Analyte				Added		Result			Unit		D	%Rec		PD Limit
Alkalinity				250		220	<b>Q</b> uu		mg/L		-	88	80 - 120	2 30
									~					
Method: 325.2 - Chloride		* . * . *							.,					
Lab Sample ID: MB 680-302724/35				,					٧			Client S	Sample ID: Meth	od Blank
Matrix: Water													Prep Type:	Total/NA
Analysis Batch: 302724														
			МВ											
Analyte			Qualifier		RL		MDL	Unit		D	F	repared	Analyzed	Dil Fac
Chloride		1.0	U		1.0			mg/L					11/11/13 13:35	1
Lab Sample ID: LCS 680-302724/1														
245 04 mpio 101 200 000 002 12 11 1										c	lien	t Samnle	a ID: Lah Contro	ol Samole
Matrix: Water										С	lien	t Sample	e ID: Lab Contro Prep Type:	-
Matrix: Water Analysis Batch: 302724										С	lien	t Sample	e ID: Lab Contro Prep Type:	-
Matrix: Water Analysis Batch: 302724				Spike		LCS	LCS	•		С	lien	t Sample		-
				Spike Added		LCS Result			Unit	С	lien D	t Sample %Rec	Prep Type:	-
Analysis Batch: 302724					i de la companya de l				Unit mg/L	C		·	Prep Type:	-
Analysis Batch: 302724  Analyse Chloride				Added	the second second	Result				С	<b>D</b>	%Rec 100	Prep Type:  %Rec. Limits  85 - 115	: Total/NA
Analysis Batch: 302724  Analyte Chloride  Lab Sample ID: 680-95803-1 DU				Added		Result				С	<b>D</b>	%Rec 100	Prep Type:  %Rec. Limits  85 - 115  ple ID: BSA-MV	Total/NA
Analysis Batch: 302724  Analyte Chloride  Lab Sample ID: 680-95803-1 DU Matrix: Water				Added	Address of the Addres	Result				C	<b>D</b>	%Rec 100	Prep Type:  %Rec. Limits  85 - 115	Total/NA
Analysis Batch: 302724  Analyte Chloride  Lab Sample ID: 680-95803-1 DU	Sample S		ple	Added		Result 50.0	Qua			C	<b>D</b>	%Rec 100	Prep Type:  %Rec. Limits  85 - 115  ple ID: BSA-MV	V-4D-1113
Analysis Batch: 302724  Analyte Chloride  Lab Sample ID: 680-95803-1 DU Matrix: Water	Sample S			Added	Address of the Addres	Result 50.0	Qua	difier		С	<b>D</b>	%Rec 100	Prep Type:  %Rec. Limits  85 - 115  ple ID: BSA-MV  Prep Type:	V-4D-1113 Total/NA
Analysis Batch: 302724  Analyte Chloride  Lab Sample ID: 680-95803-1 DU Matrix: Water Analysis Batch: 302724	•			Added		Result 50.0	Qua	difier	mg/L	С	Clie	%Rec 100	Prep Type:  %Rec. Limits  85 - 115  ple ID: BSA-MV  Prep Type:	V-4D-1113 Total/NA
Analysis Batch: 302724  Analyte Chloride  Lab Sample ID: 680-95803-1 DU Matrix: Water Analysis Batch: 302724  Analyte Chloride	Result C			Added		Result 50.0 DU Result	Qua	difier	mg/L Unit	C	Clie	%Rec 100 ent Sam	Prep Type:  %Rec. Limits  85 - 115  ple ID: BSA-MV  Prep Type:	V-4D-1113 Total/NA RPD PD Limit 0.4 30
Analysis Batch: 302724  Analyte Chloride  Lab Sample ID: 680-95803-1 DU Matrix: Water Analysis Batch: 302724  Analyte Chloride  Lab Sample ID: MB 680-303119/45	Result C			Added		Result 50.0 DU Result	Qua	difier	mg/L Unit	С	Clie	%Rec 100 ent Sam	Prep Type:  %Rec. Limits 85 - 115  sple ID: BSA-MV Prep Type:  R  Sample ID: Meth	V-4D-1113 Total/NA  RPD Limit 0.4 30
Analysis Batch: 302724  Analyte Chloride  Lab Sample ID: 680-95803-1 DU Matrix: Water Analysis Batch: 302724  Analyte Chloride  Lab Sample ID: MB 680-303119/45 Matrix: Water	Result C			Added		Result 50.0 DU Result	Qua	difier	mg/L Unit	C	Clie	%Rec 100 ent Sam	Prep Type:  %Rec. Limits  85 - 115  ple ID: BSA-MV  Prep Type:	V-4D-1113 Total/NA  RPD Limit 0.4 30
Analysis Batch: 302724  Analyte Chloride  Lab Sample ID: 680-95803-1 DU Matrix: Water Analysis Batch: 302724  Analyte Chloride  Lab Sample ID: MB 680-303119/45	Result C	Qual	lifier	Added	than and all and	Result 50.0 DU Result	Qua	difier	mg/L Unit	C	Clie	%Rec 100 ent Sam	Prep Type:  %Rec. Limits 85 - 115  sple ID: BSA-MV Prep Type:  R  Sample ID: Meth	V-4D-1113 Total/NA  RPD Limit 0.4 30
Analysis Batch: 302724  Analyte Chloride  Lab Sample ID: 680-95803-1 DU Matrix: Water Analysis Batch: 302724  Analyte Chloride  Lab Sample ID: MB 680-303119/45 Matrix: Water	Result C	Qual MB	lifier MB	Added	RL	Result 50.0 DU Result	DU Qua	difier	mg/L Unit	C	Clie	%Rec 100 ent Sam	Prep Type:  %Rec. Limits 85 - 115  sple ID: BSA-MV Prep Type:  R  Sample ID: Meth	V-4D-1113 Total/NA  RPD Limit 0.4 30

Client: Solutia Inc. Project/Site: WGK Long Term Monitori	ng - 4Q	13 N	OV 2013							Te	stAme	rica Job ID: 680- SDG:		
Method: 325.2 - Chloride (Cont	inued)	) }												
Lab Sample ID: LCS 680-303119/7 Matrix: Water									Clie	ent S	ample	ID: Lab Control Prep Type:		
Analysis Batch: 303119														
				Spike			LCS					%Rec.		
Analyte		***	·	Added			Qualifier	Unit		D 9	%Rec	Limits		
Chloride				50.0		50.0		mg/L			100	85 - 115		
Lab Sample ID: 680-95803-5 DU Matrix: Water									c	Client	t Samp	ole ID: BSA-MW Prep Type:		
Analysis Batch: 303119														
	Sample	Sam	ple			Dü	DU							RPD
Analyte	Result	Qua	lifier			Result	Qualifier	Unit		D		RP	םי	Limit
Chloride	290			Action of the second	PARTICIO 2 2000 P	284	23377744444	mg/L					2	30
Method: 353.2 - Nitrogen, Nitra	te-Nitr	ite										V. V. V. V. V. V. V. V. V. V. V. V. V. V		
Lab Sample ID: MB 680-301807/13 Matrix: Water										С	lient S	ample ID: Metho		
Analysis Batch: 301807														
	_		MB						_	_				
Analyte		e <b>suit</b>	Qualifier		RL		MDL Unit		D _	Pre	pared	Analyzed		Dil Fac
Nitrate as N	(	J.U50	U		0.050		mg/s	L				11/05/13 16:14		'
Lab Sample ID: LCS 680-301807/14 Matrix: Water								,	Clie	ent S	ample	ID: Lab Contro Prep Type:		
Analysis Batch: 301807												av. 5		
				Spike			LCS					%Rec.		
Analyte				Added 0.497		0.533	Qualifier	Unit			%Rec 107	90 . 110		
Nitrate as N								mg/L			107	90 - 110		
Nitrate Nitrite as N				0.997		1.04 0.503		mg/L			101	90 - 110		
Nitrite as N				0.500		0.503		mg/L			101	90 - 110		
Lab Sample ID: 680-95803-5 DU Matrix: Water									(	Clien	t Sam	ole ID: BSA-MW Prep Type:		
Analysis Batch: 301807														
	Sample	Sam	ple			DU	DU							RPD
Analyte	Result		lifier				Qualifier	Unit		D _		RF		Limit
Nitrate as N	0.050	U				0.050	U	mg/L				ν.	łC	10
llethod: 375.4 - Sulfate														
Lab Sample ID: MB 680-301979/39										С	lient S	Sample ID: Meth	od F	Blank
Matrix: Water										-		Prep Type:		
Analysis Batch: 301979												b . 3 bo.	•	<b></b>
, <del></del>		MB	MB											
Analyte	R	esult	Qualifier		RL		MDL Unit	t	D	Pre	pared	Analyzed	1	Dil Fac
Sulfate		5.0	U		5.0	***************************************	mg/	L				11/06/13 14:28		1
Lab Sample ID: LCS 680-301979/7									Cli	ent S	Sample	e (D: Lab Contro Prep Type:		
Matrix: Water														
Matrix: Water												1.00.1760.		
				Spike		LC\$	LCS					%Rec.		
Matrix: Water				Spike Added			LCS Qualifier	Unit		D _	%Rec	-		

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Client: Solutia Inc. TestAmerica Job ID: 680-95803-1 Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013 SDG: KPS097 Method: 415.1 - DOC Lab Sample ID: MB 680-303261/6 Client Sample ID: Method Blank Matrix: Water Prep Type: Dissolved Analysis Batch: 303261 MB MB Result Qualifier RL MDL Unit Analyzed Dil Fac Dissolved Organic Carbon 1.0 U 1.0 mg/L 11/13/13 14:43 Lab Sample ID: LCS 680-303261/5 Client Sample ID: Lab Control Sample Matrix: Water Prep Type: Dissolved Analysis Batch: 303261 Spike LCS LCS %Rec. Analyte Added Result Qualifier Limits Unit %Rec Dissolved Organic Carbon 20.0 80 - 120 17.3 mg/L 86 Lab Sample ID: 680-95803-6 DU Client Sample ID: BSA-MW-5D-F(0.2)-1113 Matrix: Water Prep Type: Dissolved Analysis Batch: 303261 Sample Sample DU DU RPD Result Qualifier Result Qualifier Unit RPD Limit Dissolved Organic Carbon 7.3 7.31 0.3 mg/L 30 Method: 415.1 - TOC Lab Sample ID: MB 680-302557/2 Client Sample ID: Method Blank Matrix: Water Prep Type: Total/NA Analysis Batch: 302557 мв мв Result Qualifier RL MDL Unit Prepared Analyzed Dif Fac Total Organic Carbon 1.0 U 1.0 mg/L 11/09/13 14:55 Lab Sample ID: LCS 680-302557/3 Client Sample ID: Lab Control Sample Matrix: Water Prep Type: Total/NA

Spike

Added

20.0

LCS LCS

19.3

Result Qualifier

Unit

mg/L

Analysis Batch: 302557

Total Organic Carbon

Analyte

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%Rec.

80 - 120

%Rec

96

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# **QC Association Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95803-1

SDG: KPS097

#### GC/MS VOA

Analysis Batch: 302958

Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
680-95803-1	BSA-MW-4D-1113	Total/NA	Water	8260B	
680-95803-3	CPA-MW-4D-1113	Total/NA	Water	8260B	
680-95803-5	BSA-MW-5D-1113	Total/NA	Water	8260B	
680-95803-7	CPA-MW-5D-1113	Total/NA	Water	8260B	
680-95803-9	4Q13 LTM Trip Blank #1	Total/NA	Water	8260B	
LCS 680-302958/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-302958/5	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 680-302958/8	Method Blank	Total/NA	Water	8260B	

Analysis Batch: 303240

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-95803-5 MS	BSA-MW-5D-1113-MS	Total/NA	Water	8260B	
680-95803-5 MSD	BSA-MW-5D-1113-MSD	Total/NA	Water	8260B	
LCS 680-303240/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-303240/12	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 680-303240/8	Method Blank	Total/NA	Water	8260B	

#### GC VOA

Analysis Batch: 302324

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-95803-1	BSA-MW-4D-1113	Total/NA	Water	RSK-175	
680-95803-3	CPA-MW-4D-1113	Total/NA	Water	RSK-175	
680-95803-5	BSA-MW-5D-1113	Total/NA	Water	RSK-175	
680-95803-7	CPA-MW-5D-1113	Total/NA	Water	RSK-175	
LCS 680-302324/10	Lab Control Sample	Total/NA	Water	RSK-175	
LCS 680-302324/8	Lab Control Sample	Total/NA	Water	RSK-175	
LCSD 680-302324/11	Lab Control Sample Dup	Total/NA	Water	RSK-175	
LCSD 680-302324/9	Lab Control Sample Dup	Total/NA	Water	RSK-175	
MB 680-302324/3	Method Blank	Total/NA	Water	RSK-175	

#### Metals

Prep Batch: 302028

Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
680-95803-1	BSA-MW-4D-1113	Total Recoverable	Water	3005A	
680-95803-2	BSA-MW-4D-F(0.2)-1113	Dissolved	Water	3005A	
680-95803-3	CPA-MW-4D-1113	Total Recoverable	Water	3005A	
680-95803-4	CPA-MW-4D-F(0.2)-1113	Dissolved	Water	3005A	
680-95803-5	BSA-MW-5D-1113	Total Recoverable	Water	3005A	
680-95803-6	BSA-MW-5D-F(0.2)-1113	Dissolved	Water	3005A	
680-95803-7	CPA-MW-5D-1113	Total Recoverable	Water	3005A	
680-95803-8	CPA-MW-5D-F(0.2)-1113	Dissolved	Water	3005A	
680-95803-8 MS	CPA-MW-5D-F(0.2)-1113	Dissolved	Water	3005A	
680-95803-8 MSD	CPA-MW-5D-F(0.2)-1113	Dissolved	Water	3005A	
LCS 680-302028/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
MB 680-302028/1-A	Method Blank	Total Recoverable	Water	3005A	

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# **QC Association Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95803-1

SDG: KPS097

#### Metals (Continued)

Anal	ysis	Batch:	302301
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Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-95803-1	BSA-MW-4D-1113	Total Recoverable	Water	6010C	302028
680-95803-2	BSA-MW-4D-F(0.2)-1113	Dissolved	Water	6010C	302028
680-95803-3	CPA-MW-4D-1113	Total Recoverable	Water	6010C	302028
680-95803-4	CPA-MW-4D-F(0,2)-1113	Dissolved	Water	6010C	302028
680-95803-5	BSA-MW-5D-1113	Total Recoverable	Water	6010C	302028
680-95803-6	BSA-MW-5D-F(0.2)-1113	Dissolved	Water	6010C	302028
680-95803-7	CPA-MW-5D-1113	Total Recoverable	Water	6010C	302028
680-95803-8	CPA-MW-5D-F(0.2)-1113	Dissolved	Water	6010C	302028
680-95803-8 MS	CPA-MW-5D-F(0.2)-1113	Dissolved	Water	6010C	302028
680-95803-8 MSD	CPA-MW-5D-F(0.2)-1113	Dissolved	Water	6010C	302028
LCS 680-302028/2-A	Lab Control Sample	Total Recoverable	Water	6010C	302028
MB 680-302028/1-A	Method Blank	Total Recoverable	Water	6010C	302028

#### **General Chemistry**

#### Analysis Batch: 301807

Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
680-95803-1	BSA-MW-4D-1113	Total/NA	Water	353,2	
680-95803-3	CPA-MW-4D-1113	Total/NA	Water	353.2	
680-95803-5	BSA-MW-5D-1113	Total/NA	Water	353.2	
680-95803-5 DU	BSA-MW-5D-1113	Total/NA	Water	353.2	
680-95803-7	CPA-MW-5D-1113	Total/NA `	Water	353.2	
LCS 680-301807/14	Lab Control Sample	Total/NA	Water	353.2	
MB 680-301807/13	Method Blank	Total/NA	Water	353.2	

#### Analysis Batch: 301979

Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
680-95803-1	BSA-MW-4D-1113	Total/NA	Water	375.4	The second secon
680-95803-3	CPA-MW-4D-1113	Total/NA	Water	375.4	
680-95803-5	BSA-MW-5D-1113	Total/NA	Water	375.4	
680-95803-7	CPA-MW-5D-1113	Total/NA	Water	375.4	
LCS 680-301979/7	Lab Control Sample	Total/NA	Water	375.4	
MB 680-301979/39	Method Blank	Total/NA	Water	375.4	

#### Analysis Batch: 302557

Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method Prep Batch
680-95803-1	BSA-MW-4D-1113	Total/NA	Water	415.1
680-95803-3	CPA-MW-4D-1113	Total/NA	Water	415.1
680-95803-5	BSA-MW-5D-1113	Total/NA	Water	415.1
680-95803-7	CPA-MW-5D-1113	Total/NA	Water	415.1
LCS 680-302557/3	Lab Control Sample	Total/NA	Water	415.1
MB 680-302557/2	Method Blank	Total/NA	Water	415.1

#### Analysis Batch: 302724

	Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
	680-95803-1	BSA-MW-4D-1113	Total/NA	Water	325.2	
-	680-95803-1 DU	BSA-MW-4D-1113	Total/NA	Water	325.2	
	680-95803-3	CPA-MW-4D-1113	Total/NA	Water	325.2	
	LCS 680-302724/1	Lab Control Sample	Total/NA	Water	325.2	
	MB 680-302724/35	Method Blank	Total/NA	Water	325.2	

# **QC Association Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95803-1

SDG: KPS097

#### General Chemistry (Continued)

Analysis Batch: 303062

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-95803-1	BSA-MW-4D-1113	Total/NA	Water	310.1	····
680-95803-1 DU	BSA-MW-4D-1113	Total/NA	Water	310,1	
680-95803-3	CPA-MW-4D-1113	Total/NA	Water	310.1	
680-95803-5	BSA-MW-5D-1113	Total/NA	Water	310,1	
LCS 680-303062/6	Lab Control Sample	Total/NA	Water	310.1	
LCSD 680-303062/32	Lab Control Sample Dup	Total/NA	Water	310.1	
MB 680-303062/5	Method Blank	Total/NA	Water	310.1	

Analysis Batch: 303119

Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
680-95803-5	BSA-MW-5D-1113	Total/NA	Water	325.2	
680-95803-5 DU	BSA-MW-5D-1113	Total/NA	Water	325.2	
680-95803-7	CPA-MW-5D-1113	Total/NA	Water	325.2	
LCS 680-303119/7	Lab Control Sample	Total/NA	Water	325.2	
MB 680-303119/45	Method Blank	Total/NA	Water	325.2	

Analysis Batch: 303261

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-95803-2	BSA-MW-4D-F(0.2)-1113	Dissolved	Water	415.1	
680-95803-4	CPA-MW-4D-F(0.2)-1113	Dissolved	Water	415.1	
680-95803-6	BSA-MW-5D-F(0.2)-1113	Dissolved	Water	415.1	
680-95803-6 DU	BSA-MW-5D-F(0.2)-1113 \	Dissolved	Water	415.1	
680-95803-8	CPA-MW-5D-F(0.2)-1113	Dissolved	Water	415.1	
LCS 680-303261/5	Lab Control Sample	Dissolved	Water	415,1	
MB 680-303261/6	Method Blank	Dissolved	Water	415.1	

Analysis Batch: 303380

Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
680-95803-7	CPA-MW-5D-1113	Total/NA	Water	310.1	777777777777777777777777777777777777777
LCS 680-303380/6	Lab Control Sample	Total/NA	Water	310.1	
LCSD 680-303380/32	Lab Control Sample Dup	Total/NA	Water	310.1	
MB 680-303380/5	Method Blank	Total/NA	Water	310.1	

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#### Lab Chronicle

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95803-1

SDG: KPS097

Client Sample ID: BSA-MW-4D-1113

Date Collected: 11/04/13 13:45 Date Received: 11/05/13 09:52

Lab Sample ID: 680-95803-1

Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Ргер Туре	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		25	302958	11/13/13 15:37	JD1	TAL SAV
Total/NA	Analysis	RSK-175		1	302324	11/08/13 15:31	AJMC	TAL SAV
Total Recoverable	Prep	3005A			302028	11/06/13 17:15	DAS	TAL SAV
Total Recoverable	Analysis	6010C		1	302301	11/07/13 19:38	BCB	TAL SAV
Total/NA	Analysis	353.2		1	301807	11/05/13 16:46	CRW	TAL SAV
Total/NA	Analysis	375.4		10	301979	11/06/13 11:54	JME	TAL SAV
Total/NA	Analysis	415.1		1	302557	11/09/13 19:59	CMP	TAL SAV
Total/NA	Analysis	325.2		1	302724	11/11/13 13:00	JME	TAL SAV
Total/NA	Analysis	310.1		1	303062	11/13/13 12:24	TAR	TAL SAV

Client Sample ID: BSA-MW-4D-F(0.2)-1113

Date Collected: 11/04/13 13:45

Lab Sample ID: 680-95803-2

Matrix: Water

Date Received: 11/05/13 09:52

Batch Batch Dilution Batch Prepared Method Prep Type Туре Run Factor Number or Analyzed Analyst Lab Dissolved Prep 3005A 302028 11/06/13 17:15 DAS TAL SAV Dissolved 6010C 302301 BCB TAL SAV Analysis 1 11/07/13 19:42 TAL SAV Dissolved Analysis 415.1 303261 11/13/13 16:01 CMP

Client Sample ID: CPA-MW-4D-1113

Date Collected: 11/04/13 11:50

Date Received: 11/05/13 09:52

Lab Sample ID: 680-95803-3

Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Totai/NA	Analysis	8260B	<del></del>	2	302958	11/13/13 16:07	JD1	TAL SAV
Total/NA	Analysis	RSK-175		1	302324	11/08/13 15:18	AJMC	TAL SAV
Total Recoverable	Prep	3005A			302028	11/06/13 17:15	DAS	TAL SAV
Total Recoverable	Analysis	6010C		1	302301	11/07/13 19:47	BCB	TAL SAV
Total/NA	Analysis	353.2	•	1	301807	11/05/13 16:31	CRW	TAL SAV
Total/NA	Analysis	375.4		1	301979	11/06/13 11:33	JME	TAL SAV
Total/NA	Analysis	415.1		1	302557	11/09/13 20:13	CMP	TAL SAV
Total/NA	Analysis	325.2		5	302724	11/11/13 13:26	JME	TAL SAV
Total/NA	Analysis	310.1		1	303062	11/13/13 12:10	TAR	TAL SAV

Client Sample ID: CPA-MW-4D-F(0.2)-1113

Date Collected: 11/04/13 11:50 Date Received: 11/05/13 09:52

Lab Sample ID: 680-95803-4

Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	3005A	**************		302028	11/06/13 17:15	DAŞ	TAL SAV
Discolved	Analysis	6010C		4	302301	11/07/13 10:52	BCB	VAS LAT

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#### Lab Chronicle

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95803-1

SDG: KPS097

Client Sample ID: CPA-MW-4D-F(0.2)-1113

Date Collected: 11/04/13 11:50

Lab Sample ID: 680-95803-4

Matrix: Water

Date Received: 11/05/13 09:52

		Batch	Batch		Dilution	Batch	Prepared		
	Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
1	Dissolved	Analysis	415.1		1	303261	11/13/13 16:15	CMP	TAL SAV

Lab Sample ID: 680-95803-5

Matrix: Water

Client Sample ID: BSA-MW-5D-1113

Date Collected: 11/04/13 15:30 Date Received: 11/05/13 09:52

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		5	302958	11/13/13 16:36	JD1	TAL SAV
Total/NA	Analysis	RSK-175		1	302324	11/08/13 15:05	AJMC	TAL SAV
Total Recoverable	Prep	3005A			302028	11/06/13 17:15	DAS	TAL SAV
Total Recoverable	Analysis	6010C		1	302301	11/07/13 19:56	BCB	TAL SAV
Total/NA	Analysis	353.2		1	301807	11/05/13 16:35	CRW	TAL SAV
Total/NA	Analysis	375.4		1	301979	11/06/13 11:33	JME	TAL SAV
Total/NA	Analysis	415.1		1	302557	11/09/13 20:27	CMP	TAL SAV
Total/NA	Analysis	310.1		1	303062	11/13/13 12:00	TAR	TAL SAV
Total/NA	Analysis	325.2		5	303119	11/13/13 14:49	JME	TAL SAV

Client Sample ID: BSA-MW-5D-F(0.2)-1113

Date Collected: 11/04/13 15:30

Date Received: 11/05/13 09:52

Lab Sample ID: 680-95803-6

Matrix: Water

····	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			302028	11/06/13 17:15	DAS	TAL SAV
Dissolved	Analysis	6010C		1	302301	11/07/13 20:01	BCB	TAL SAV
Dissolved	Analysis	415.1		1	303261	11/13/13 17:01	CMP	TAL SAV

Client Sample ID: CPA-MW-5D-1113

Date Collected: 11/04/13 10:10

Date Received: 11/05/13 09:52

Lab Sample	D: 680-95803-7
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Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B	***************************************	20	302958	11/13/13 17:06	JD1	TAL SAV
Total/NA	Analysis	RSK-175		1	302324	11/08/13 14:52	AJMC	TAL SAV
Total Recoverable	Prep	3005A			302028	11/06/13 17:15	DAS	TAL SAV
Total Recoverable	Analysis	6010C		1	302301	11/07/13 20:05	BCB	TAL SAV
Total/NA	Analysis	353.2		1	301807	11/05/13 16:34	CRW	TAL SAV
Total/NA	Analysis	375.4		10	301979	11/06/13 11:54	JME	TAL SAV
Total/NA	Analysis	415.1		1	302557	11/09/13 20:42	CMP	TAL SAV
Total/NA	Analysis	325.2		5	303119	11/13/13 14:49	JME	TAL SAV
Total/NA	Analysis	310.1		1	303380	11/14/13 16:50	LBH	TAL SAV

TestAmerica Savannah

DEC 0 4 2013 MM

#### Lab Chronicle

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95803-1

SDG: KPS097

Client Sample ID: CPA-MW-5D-F(0.2)-1113

Date Collected: 11/04/13 10:10 Date Received: 11/05/13 09:52 Lab Sample ID: 680-95803-8

Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Ргер Туре	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	3005A		***************************************	302028	11/06/13 17:15	DAS	TAL SAV
Dissolved	Analysis	6010C		1	302301	11/07/13 20:10	BCB	TAL SAV
Dissolved	Analysis	415.1		1	303261	11/13/13 17:28	CMP	TAL SAV

Client Sample ID: 4Q13 LTM Trip Blank #1

Date Collected: 11/04/13 00:00

Lab Sample ID: 680-95803-9

Matrix: Water

Date Received: 11/05/13 09:52

-		Batch	Batch		Dilution	Batch	Prepared		
	Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
	Total/NA	Analysis	8260B	***************************************	1	302958	11/13/13 13:02	JD1	TAL SAV

Laboratory References:

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

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Direct Days 12x 912.32.0163  Client Contact  URS Corporation  1001 Highlands Plaza Drive West, Suite 300  St. Louis, MO 63110  Phone  (314) 429-0100  Phone  (314) 429-0462  Project Name: 4Q13 LTM GW Sampling  Site: Solutia WG Krummitch Facility  P O #	E 0 0 1 2 2 2 2 0 0 1 1 1 1 1 1 1 1 1 1 1	ullman naround Tim Days (W)		Site Contact: Michael Corbett								E		
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Sample Identification		mple	# of Matrix Cont	AOC# PA 85 KITELET RE	Total Pe/Min	Chloride by	Dissolved G	TOC by 415	DOC Ph 412			68	ple Specific Notes:	tes:
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4Q13 LTM Trip Blank # 1	11/4/13 -	*	Water 2	2			_	$\exists$		$\neg$				
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other	6= Other			7	#	-	1 3,1	7	17	-				
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#### Login Sample Receipt Checklist

Client: Solutia Inc.

Job Number: 680-95803-1

SDG Number: KPS097

List Source: TestAmerica Savannah

List Number: 1

Creator: Conner, Keaton

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	,
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

# **Certification Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95803-1

SDG: KPS097

#### Laboratory: TestAmerica Savannah

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
	AFCEE		SAVLAB	
A2LA	DoD ELAP		399.01	02-28-15
A2LA	ISO/IEC 17025		399.01	02-28-15
Alabama	State Program	4	41450	06-30-14
Arkansas DEQ	State Program	6	88-0692	02-01-14
California	NELAP	9	3217CA	07-31-14
Colorado	State Program	8	N/A	12-31-13 *
Connecticut	State Program	1	PH-0161	03-31-15
Florida	NELAP	4	E87052	06-30-14
GA Dept. of Agriculture	State Program	4	N/A	12-31-13 *
Georgia	State Program	4	N/A	06-30-14
Georgia	State Program	4	803	06-30-14
Guam	State Program	9	09-005r	06-17-14
Hawaii	State Program	9	N/A	06-30-14
Illinois	NELAP	5	200022	11-30-13 *
Indiana	State Program	5	N/A	06-30-14
lowa	State Program	7	353	07-01-15
Kentucky	State Program	4	90084	12-31-13 *
Kentucky (UST)	State Program	4	18	06-30-14
Louísiana	NELAP	6	30690	06-30-14
Maine	State Program	1	GA00006	08-16-14
Maryland	State Program	3	250	12-31-13 *
, Massachusetts	State Program	· 1	M-GA006	06-30-14
Michigan	State Program	5	9925	06-30-14
Mississippi	State Program	4	N/A	06-30-14
Montana	State Program	8	CERT0081	01-01-14 *
Nebraska	State Program	7	TestAmerica-Savannah	06-30-14
New Jersey	NELAP	2	GA769	06-30-14
New Mexico	State Program	6	N/A	06-30-14
New York	NELAP	2	10842	04-01-14
North Carolina DENR	State Program	4	269	12-31-13 *
North Carolina DHHS	State Program	4	13701	07-31-14
Oklahoma	State Program	6	9984	08-31-14
Реплsylvania	NELAP	3	68-00474	06-30-14
Puerto Rico		2	GA00006	01-01-14 *
South Carolina	State Program	4	98001	06-30-14
	State Program State Program	4	TN02961	06-30-14
Tennessee	ū		T104704185-08-TX	11-30-13 *
Texas	NELAP	6		04-07-14
USDA Visainia	Federal	2	SAV 3-04	
Virginia	NELAP	3	460161	06-14-14
Washington	State Program	10	C1794	06-10-14
West Virginia	State Program	3	9950C	12-31-13 *
West Virginia DEP	State Program	3	94	06-30-14
Wisconsin '	State Program	5	999819810	08-31-14
Wyoming	State Program	8	8TMS-L	06-30-14

DEC 0 4 2013 /

<sup>\*</sup> Expired certification is currently pending renewal and is considered valid.

# Solutia Krummrich Data Review WGK LTM 4Q13

**Laboratory SDG: KPS098** 

Data Reviewer: Melissa Mansker Peer Reviewer: Elizabeth Kunkel

**Date Reviewed: 12/5/2013** 

Guidance: USEPA National Functional Guidelines for Superfund Organic Methods Data Review 2008. USEPA National Functional Guidelines for Superfund

**Inorganic Data Review 2010** 

Work Plan: Revised Long-Term Monitoring Program (LTMP) Work Plan (Solutia

2009)

Sample Ide	entification
BSA-MW-1S-1113	BSA-MW-1S-F(0.2)-1113
CPA-MW-1D-1113	CPA-MW-1D-F(0.2)-1113
CPA-MW-2D-1113	CPA-MW-2D-1113-AD
CPA-MW-2D-F(0.2)-1113	CPA-MW-1D-1113-EB
BSA-MW-3D-1113	BSA-MW-3D-F(0.2)-1113
4Q13 LTM Trip Blank #2	

#### 1.0 Data Package Completeness

Were all items delivered as specified in the QAPP and COC as appropriate?

Yes

#### 2.0 Laboratory Case Narrative \ Cooler Receipt Form

Were problems noted in the laboratory case narrative or cooler receipt form?

Yes, the laboratory case narrative indicated sulfate MS/MSD recoveries were outside evaluation criteria for sample BSA-MW-1S-1113. Samples were diluted due to high levels of target analytes. Although not indicated in the laboratory case narrative, VOCs were detected in the equipment blank. These issues are addressed further in the appropriate sections below.

The cooler receipt form indicated that a pH > 2 for dissolved organic carbon in samples BSA-MW-1S-F(0.2)-1113 and CPA-MW-1D-F(0.2)-1113; please see section 11.0 of this review for qualifications. Additionally, the laboratory indicated that the container identification information for sample BSA-MW-1S-1113 did not match the COC. URS contacted the laboratory; data were reported using the correct COC-designated sample IDs.

#### 3.0 Holding Times

Were samples extracted/analyzed within applicable limits?

Yes

#### 4.0 Blank Contamination

Were any analytes detected in the Method Blanks, Field Blanks or Trip Blanks? Yes

Blank ID	Parameter	Analyte	Concentration/Amount
CPA-MW-1D-1113-EB	VOCs	Benzene	20 ug/L
CPA-MW-1D-1113-EB	VOCs	Chlorobenzene	9.8 ug/L
CPA-MW-1D-1113-EB	VOCs	1,4-Dichlorobenzene	10 ug/L

Qualifications due to blank contamination are included in the table below. Due to the uncertainty of potential carryover, detections for benzene were qualified as estimated. Analytical data that were reported non-detect or at concentrations greater than five times (5X) the associated blank concentration did not required qualification.

Sample ID	Parameter	Analyte	New Reporting Limit (RL)	Qualification
BSA-MW-3D-1113	VOCs	Benzene	-	J

#### 5.0 Laboratory Control Sample

Were LCS recoveries within evaluation criteria?

Yes

## 6.0 Surrogate Recoveries

Were surrogate recoveries within evaluation criteria?

Yes

#### 7.0 Matrix Spike and Matrix Spike Duplicate Recoveries

Were MS/MSD samples collected as part of this SDG?

Yes, although not requested, sample BSA-MW-1S-1113 was spiked and analyzed for sulfate.

Were MS/MSD recoveries within evaluation criteria?

No

MS/MSD ID	Parameter	Analyte	MS/MSD Recovery	RPD	MS/MSD/ RPD Criteria
BSA-MW-1S-1113	General chemistry	Sulfate	44/52	17	75-125/30

Analytical data that required qualification based on MS/MSD data are included in the table below.

Sample ID	Parameter	Analyte	Qualification
BSA-MW-1S-1113	General chemistry	Sulfate	UJ

#### 8.0 Internal Standard (IS) Recoveries

Were internal standard area recoveries within evaluation criteria?

Yes

#### 9.0 Laboratory Duplicate Results

Were laboratory duplicate samples collected as part of this SDG?

Yes, sample BSA-MW-3D-1113 was spiked and analyzed for alkalinity and free carbon dioxide, sample CPA-MW-2D-1113 was spiked and analyzed for sulfate, and sample BSA-MW-1S-1113 was spiked and analyzed for total organic carbon.

Were laboratory duplicate sample RPDs within criteria?

Yes

#### 10.0 Field Duplicate Results

Were field duplicate samples collected as part of this SDG?

Yes

Field ID	Field Duplicate ID
CPA-MW-2D-1113	CPA-MW-2D-1113-AD

Were field duplicates within evaluation criteria?

Yes

#### 10.0 Sample Dilutions

For samples that were diluted and nondetect, were undiluted results also reported?

Not applicable; analytes were detected in samples that were diluted.

#### 11.0 Additional Qualifications

Were additional qualifications applied?

Yes, the following samples are qualified, as summarized below, due to pH > 2.

Sample ID	Parameter	Analyte	Qualification
BSA-MW-1S-F(0.2)-1113	General chemistry	Dissolved organic carbon	J
CPA-MW-1D-F(0.2)-1113	General chemistry	Dissolved organic carbon	J

# SDG KPS098

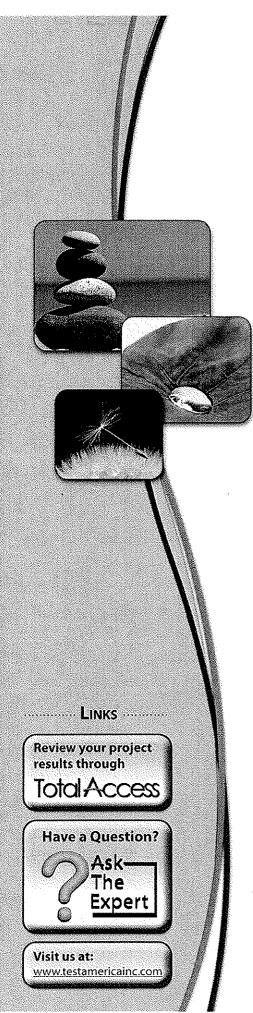
Results of Samples from Monitoring Well:

BSA-MW-1S

BSA-MW-3D

CPA-MW-1D

CPA-MW-2D



# **TestAmerica**

THE LEADER IN ENVIRONMENTAL TESTING

# **ANALYTICAL REPORT**

TestAmerica Laboratories, Inc. TestAmerica Savannah 5102 LaRoche Avenue Savannah, GA 31404 Tel: (912)354-7858

TestAmerica Job ID: 680-95841-1

TestAmerica Sample Delivery Group: KPS098

Client Project/Site: WGK Long Term Monitoring - 4Q13 NOV

2013

For:

Solutia Inc. 575 Maryville Centre Dr. Saint Louis, Missouri 63141

Attn: Mr. Jerry Rinaldi

Michele RKusy

Authorized for release by: 11/26/2013 2:21:23 PM

Michele Kersey, Project Manager I (912)354-7858 michele.kersey@testamericainc.com

Reviewedon DEC 05 2013

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95841-1

SDG: KPS098

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#### **Case Narrative**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95841-1

SDG: KPS098

Job ID: 680-95841-1

Laboratory: TestAmerica Savannah

Narrative

#### **CASE NARRATIVE**

Client: Solutia Inc.

Project: WGK Long Term Monitoring - 4Q13 NOV 2013

Report Number: 680-95841-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

#### RECEIPT

The samples were received on 11/6/2013 9:37 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.6° C.

#### Except:

Method(s) 82608: The container label for the following sample(s) did not match the information listed on the Chain-of-Custody (COC): BSA-MW-1S-1113 (680-95841-1). The container labels list BSA-MW-2D-113. The COC lists BSA-MW-1S-113. The date and the times do match.

Method(s) 415.1, SM 5310B: The following sample(s) were collected in properly preserved vials, however, the pH was outside the required criteria when verified by the laboratory: BSA-MW-1S-F(0.2)-1113 (680-95841-2), CPA-MW-1D-F(0.2)-1113 (680-95841-4).

#### **VOLATILE ORGANIC COMPOUNDS (GC-MS)**

Samples BSA-MW-1S-1113 (680-95841-1), CPA-MW-1D-1113 (680-95841-3), CPA-MW-2D-1113 (680-95841-5), CPA-MW-2D-1113-AD (680-95841-6), CPA-MW-1D-1113-EB (680-95841-8), BSA-MW-3D-1113 (680-95841-9) and 4Q13 LTM Trip Blank #2 (680-95841-11) were analyzed for Volatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 11/13/2013.

Samples BSA-MW-1S-1113 (680-95841-1)[10000X], CPA-MW-1D-1113 (680-95841-3)[250X], CPA-MW-2D-1113 (680-95841-5)[250X], CPA-MW-2D-1113-AD (680-95841-6)[250X] and BSA-MW-3D-1113 (680-95841-9)[50X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the volatiles analysis.

All quality control parameters were within the acceptance limits.

#### **DISSOLVED GASES**

Samples BSA-MW-1S-1113 (680-95841-1), CPA-MW-1D-1113 (680-95841-3), CPA-MW-2D-1113 (680-95841-5) and BSA-MW-3D-1113 (680-95841-9) were analyzed for dissolved gases in accordance with RSK-175. The samples were analyzed on 11/08/2013.

No difficulties were encountered during the dissolved gases analysis.

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#### **Case Narrative**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95841-1

SDG: KPS098

Job ID: 680-95841-1 (Continued)

Laboratory: TestAmerica Savannah (Continued)

All quality control parameters were within the acceptance limits.

#### METALS (ICP)

Samples BSA-MW-1S-F(0.2)-1113 (680-95841-2), CPA-MW-1D-F(0.2)-1113 (680-95841-4), CPA-MW-2D-F(0.2)-1113 (680-95841-7) and BSA-MW-3D-F(0.2)-1113 (680-95841-10) were analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 11/08/2013 and analyzed on 11/11/2013.

No difficulties were encountered during the metals analysis.

All quality control parameters were within the acceptance limits.

#### METALS (ICP)

Samples BSA-MW-1S-1113 (680-95841-1), CPA-MW-1D-1113 (680-95841-3), CPA-MW-2D-1113 (680-95841-5) and BSA-MW-3D-1113 (680-95841-9) were analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 11/08/2013 and analyzed on 11/11/2013.

No difficulties were encountered during the metals analysis.

All quality control parameters were within the acceptance limits.

#### ALKALINITY

Samples BSA-MW-1S-1113 (680-95841-1), CPA-MW-1D-1113 (680-95841-3), CPA-MW-2D-1113 (680-95841-5) and BSA-MW-3D-1113 (680-95841-9) were analyzed for alkalinity in accordance with EPA Method 310.1. The samples were analyzed on 11/14/2013.

No difficulties were encountered during the alkalinity analysis.

All quality control parameters were within the acceptance limits.

#### CHLORIDE

Samples BSA-MW-1S-1113 (680-95841-1), CPA-MW-1D-1113 (680-95841-3), CPA-MW-2D-1113 (680-95841-5) and BSA-MW-3D-1113 (680-95841-9) were analyzed for Chloride in accordance with EPA Method 325.2. The samples were analyzed on 11/13/2013.

Samples CPA-MW-1D-1113 (680-95841-3)[2X] and BSA-MW-3D-1113 (680-95841-9)[2X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the chloride analysis.

All quality control parameters were within the acceptance limits.

#### **NITRATE-NITRITE AS NITROGEN**

Samples BSA-MW-1S-1113 (680-95841-1), CPA-MW-1D-1113 (680-95841-3), CPA-MW-2D-1113 (680-95841-5) and BSA-MW-3D-1113 (680-95841-9) were analyzed for nitrate-nitrite as nitrogen in accordance with EPA Method 353.2. The samples were analyzed on 11/06/2013.

No difficulties were encountered during the nitrate-nitrite analysis.

All quality control parameters were within the acceptance limits.

#### **SULFATE**

Samples BSA-MW-1S-1113 (680-95841-1), CPA-MW-1D-1113 (680-95841-3), CPA-MW-2D-1113 (680-95841-5) and BSA-MW-3D-1113 (680-95841-9) were analyzed for sulfate in accordance with EPA Method 375.4. The samples were analyzed on 11/08/2013.

The matrix spike / matrix spike duplicate (MS/MSD) recoveries for batch 302385 were outside control limits. The associated laboratory control sample (LCS) recovery met acceptance criteria.

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TestAmerica Savannah

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#### **Case Narrative**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95841-1

SDG: KPS098

Job ID: 680-95841-1 (Continued)

Laboratory: TestAmerica Savannah (Continued)

Refer to the QC report for details.

Samples CPA-MW-2D-1113 (680-95841-5)[5X] and BSA-MW-3D-1113 (680-95841-9)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No other difficulties were encountered during the sulfate analysis.

All other quality control parameters were within the acceptance limits.

#### **TOTAL ORGANIC CARBON**

Samples BSA-MW-1S-1113 (680-95841-1), CPA-MW-1D-1113 (680-95841-3), CPA-MW-2D-1113 (680-95841-5) and BSA-MW-3D-1113 (680-95841-9) were analyzed for total organic carbon in accordance with EPA Method 415.1. The samples were analyzed on 11/14/2013.

No difficulties were encountered during the TOC analysis.

All quality control parameters were within the acceptance limits.

#### **DISSOLVED ORGANIC CARBON (DOC)**

Samples BSA-MW-1S-F(0.2)-1113 (680-95841-2), CPA-MW-1D-F(0.2)-1113 (680-95841-4), CPA-MW-2D-F(0.2)-1113 (680-95841-7) and BSA-MW-3D-F(0.2)-1113 (680-95841-10) were analyzed for Dissolved Organic Carbon (DOC) in accordance with EPA Method 415.1. The samples were analyzed on 11/13/2013.

No difficulties were encountered during the DOC analysis.

All quality control parameters were within the acceptance limits.

DEC 0 5 2013

### Sample Summary

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95841-1

SDG: KPS098

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-95841-1	BSA-MW-1S-1113	Water	11/05/13 10:20	11/06/13 09:37
680-95841-2	BSA-MW-1S-F(0.2)-1113	Water	11/05/13 10:20	11/06/13 09:37
680-95841-3	CPA-MW-1D-1113 هممه	Water	11/05/13 13:45	11/06/13 09:37
680-95841-4	CPA-MW-1D-F(0.2)-1113	Water	11/05/13 13:45	11/06/13 09:37
680-95841-5	CPA-MW-2D-1113	Water	11/05/13 12:05	11/06/13 09:37
680-95841-6	CPA-MW-2D-1113-AD	Water	11/05/13 12:05	11/06/13 09:37
680-95841-7	CPA-MW-2D-F(0.2)-1113	Water	11/05/13 12:05	11/06/13 09:37
680-95841-8	CPA-MW-1D-1113-EB	Water	11/05/13 12:50	11/06/13 09:37
680-95841-9	BSA-MW-3D-1113	Water	11/05/13 15:20	11/06/13 09:37
680-95841-10	BSA-MW-3D-F(0.2)-1113	Water	11/05/13 15:20	11/06/13 09:37
680-95841-11	4Q13 LTM Trip Blank #2	Water	11/05/13 00:00	11/06/13 09:37

DEC 0 5 2013

### **Method Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95841-1 SDG: KPS098

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SAV
RSK-175	Dissolved Gases (GC)	RSK	TAL SAV
6010C	Metals (ICP)	SW846	TAL SAV
310.1	Alkalinity	MCAWW	TAL SAV
325.2	Chloride	MCAWW	TAL SAV
353.2	Nitrogen, Nitrate-Nitrite	MCAWW	TAL SAV
375.4	Sulfate	MCAWW	TAL SAV
415.1	TOC	MCAWW	TAL SAV
415.1	DOC	MCAWW	TAL SAV

#### Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

RSK = Sample Prep And Calculations For Dissolved Gas Analysis In Water Samples Using A GC Headspace Equilibration Technique, RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Lab

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

### **Definitions/Glossary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95841-1

SDG: KPS098

Qualifiers

GC/MS VOA

Qualifier Qualifier Description

Indicates the analyte was analyzed for but not detected

GC VOA

Qualifier

Qualifier Description

Indicates the analyte was analyzed for but not detected.

Metals

Qualifier

Qualifier Description

Indicates the analyte was analyzed for but not detected.

**General Chemistry** 

Qualifier

Qualifier Description

Ü F

Indicates the analyte was analyzed for but not detected.

MS/MSD Recovery and/or RPD exceeds the control limits

Glossary

Abbreviation

These commonly used abbreviations may or may not be present in this report.

Listed under the "D" column to designate that the result is reported on a dry weight basis

%R CNF Percent Recovery Contains no Free Liquid

DER Duplicate error ratio (normalized absolute difference)

Dil Fac Dilution Factor

DL, RA, RE, IN Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample

DLC MDA Decision level concentration Minimum detectable activity

EDL Estimated Detection Limit MDC Minimum detectable concentration

MDL Method Detection Limit ML Minimum Level (Dioxin)

NC Not Calculated

ND Not detected at the reporting limit (or MDL or EDL if shown)

PQL Practical Quantitation Limit

OC. Quality Control RER Relative error ratio

RŁ Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin) TEO Toxicity Equivalent Quotient (Dioxin)

### **Detection Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95841-1

SDG: KPS098

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Analyte	Result Q	ualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	920000		10000		ug/L	10000		8260B	Total/NA
Methane (TCD)	7000		0.58		ug/L	1		RSK-175	Total/NA
Iron	8.3		0.050		mg/L	1		6010C	Total
Manganese	0.87		0,010		mg/L	1		6010C	Recoverable Total Recoverable
Chloride	100		1,0		mg/L	1		325.2	Total/NA
Total Organic Carbon	7.2		1.0		mg/L	1		415.1	Total/NA
Analyte	Result Q	ualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Alkalinity	760		5.0		mg/L	1		310.1	Total/NA
Carbon Dioxide, Free	41		5.0		mg/L	1		310.1	Total/NA

### Client Sample ID: BSA-MW-1S-F(0.2)-1113

### Lab Sample ID: 680-95841-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron, Dissolved	8.2		0.050		mg/L	1		6010C	Dissolved
Manganese, Dissolved	0.87		0.010		mg/L	1		6010C	Dissolved
Dissolved Organic Carbon	6.7	ゴ	1.0		mg/L	1		415.1	Dissolved

### Client Sample ID: CPA-MW-1D-1113

### Lab Sample ID: 680-95841-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	9300		250	-,	ug/L	250	_	8260B	Total/NA
Chlorobenzene	23000		250	,	ug/L	250		8260B	Total/NA
1,2-Dichtorobenzene	21000		250		ug/L	250		8260B	Total/NA
1,3-Dichlorobenzene	1900		250		ug/Ł	250		8260B	Total/NA
1,4-Dichlorobenzene	15000		250		ug/L	250		8260B	Total/NA
fron	0.20		0.050		mg/L	1		6010C	Total
									Recoverable
Manganese	0.036		0.010		mg/Ł	1		6010C	Total
									Recoverable
Chloride	100		2.0		mg/L	2		325.2	Total/NA
Total Organic Carbon	11		1.0		mg/L	1		415.1	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Ргер Туре
Alkalinity	720		5.0		mg/L	1		310.1	Total/NA

### Client Sample ID: CPA-MW-1D-F(0.2)-1113

### Lab Sample ID: 680-95841-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron, Dissolved	0.070	***************************************	0.050		mg/L	1		6010C	Dissolved
Manganese, Dissolved	0.026		0.010		mg/L	1		6010C	Dissolved
Dissolved Organic Carbon	10	J	1.0		mg/L	1		415.1	Dissolved

### Client Sample ID: CPA-MW-2D-1113

### Lab Sample ID: 680-95841-5

Analyte	Result	Qualifier	RL	MDL	Unit		D	Method	Prep Type	
Benzene	610	***************************************	250	***************************************	ug/L	250		8260B	 Total/NA	
Chlorobenzene	36000		250		ug/L	250		8260B	Total/NA	
1,2-Dichlorobenzene	640		250		ug/L	250		8260B	Total/NA	
1,3-Dichlorobenzene	500		250		ug/L	250		8260B	Total/NA	
1,4-Dichloroberizerie	11000		250		ug/L	250		8260B	Total/NA	

This Detection Summary does not include radiochemical test results.

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### **Detection Summary**

RL

1.1

0.58

0.050

0.010

1.0

25

1.0

RL

5.0

5.0

MDL Unit

ug/L

ug/L

mg/L

mg/L

mg/L

mg/L

mg/L

mg/L

mg/L

RLUnit

Client: Solutia Inc.

Analyte

Ethane

Iron

Methane (TCD)

Manganese

Total Organic Carbon

Carbon Dioxide, Free

Chloride

Sulfate

Analyte

Alkalinity

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

Client Sample ID: CPA-MW-2D-1113 (Continued)

Result Qualifier

2.0

850

6.4

0.36

48

59

8.8

470

30

Result Qualifier

TestAmerica Job ID: 680-95841-1 SDG: KPS098

Lab Sample ID: 680-95841-5

Dil Fac	D	Method	Ргер Туре
 1		RSK-175	Total/NA
1		RSK-175	Total/NA
1		6010C	Total
			Recoverable
1		6010C	Total
			Recoverable
		205.0	T-1-10()

#### 325.2 Total/NA 375.4 Total/NA 415.1 Total/NA Dil Fac D Method Prep Type 310.1 Total/NA 310.1 Total/NA

Lab Sample ID: 680-95841-6

Lab Sample ID: 680-95841-7

Lab Sample ID: 680-95841-8

### Client Sample ID: CPA-MW-2D-1113-AD

/·· -						
Analyte	Result Qualifi	ier RL	MDL Unit	Dil Fac	D Metho	d Prep Type
Benzene	640	250	ug/L	250	8260B	Total/NA
Chlorobenzene	35000	250	υg/L	250	8260B	Total/NA
1,2-Dichlorobenzene	730	250	ug/L	250	8260B	Total/NA
1,3-Dichlorobenzene	500	250	ug/L	250	8260B	Total/NA
1,4-Dichlorobenzene	11000	250	ug/L	250	8260B	Total/NA

### Client Sample ID: CPA-MW-2D-F(0.2)-1113

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron, Dissolved	7.0	***************************************	0.050		mg/L	1		6010C	Dissolved
Manganese, Dissolved	0.40		0.010		mg/L	1		6010C	Dissolved
Dissolved Organic Carbon	7.9		1.0		mg/L	1		415.1	Dissolved

#### Client Sample ID: CPA-MW-1D-1113-EB

,					
Analyte Result Qua	alifier RL	MDL Unit	Dil Fac	Method	Prep Type
Benzene 20	1.0	ug/L	1	8260B	Total/NA
Chlorobenzene (9.8)	1.0	ug/L	1	8260B	Total/NA
1,4-Dichlorobenzene	1.0	υg/L	1	8260B	Total/NA

#### Client Sample ID: BSA-MW-3D-1113

Client Sample ID: BSA-M	W-3D-1113				Lab	Sample ID	): 680-95841-9
Analyte	Result	Qualifier	RL	MDL Unit	Dil Fac D	Method	Prep Type
Benzene	90	J	50	ug/L	50	8260B	Total/NA
Chlorobenzene	2400		50	ug/L	50	8260B	Total/NA
1,4-Dichlorobenzene	350		50	ug/L	50	8260B	Total/NA
Ethane	3.3		1.1	ug/L	1	RSK-175	Total/NA
Methane (TCD)	1900		0.58	υg/L	1	RSK-175	Total/NA
Iron	10		0.050	mg/L	1	6010C	Total
Manganese	0.52		0.010	mg/L	1	6010C	Recoverable Total Recoverable
Chloride	120		2.0	mg/L	2	325.2	Total/NA
Sulfate	64		25	mg/L	5	375.4	Total/NA
Total Organic Carbon	3.4		1.0	mg/L	1	415.1	Total/NA

This Detection Summary does not include radiochemical test results.

### **Detection Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95841-1

Lab Sample ID: 680-95841-9

SDG: KPS098

Client Sample ID: BSA-MW-3D-1113 (Continued)

	Dil Fac	D	Method	Prep Type
•	1	~~~	310 1	Total/NIA

	Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Section 2	Alkalinity	440	MILLER OF PROPERTY OF STREET	5.0		mg/L	1		310.1	Total/NA
· · · · · · · · · · · · · · · · · · ·	Carbon Dioxide, Free	29		5.0		mg/L	1		310.1	Total/NA

## Client Sample ID: BSA-MW-3D-F(0.2)-1113

Lab Sample	ID: 680-95841-10
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Analyte	Result Qualifier	RL	MDL Unit	Dil Fac D	Method	Prep Type
Iron, Dissolved	10	0.050	mg/L	1	6010C	Dissolved
Manganese, Dissolved	0.53	0.010	mg/L	1	6010C	Dissolved
Dissolved Organic Carbon	3.6	1.0	mg/L	1	415.1	Dissolved

### Client Sample ID: 4Q13 LTM Trip Blank #2

Lab Sample ID: 680-95841-11

No Detections.

This Detection Summary does not include radiochemical test results.

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95841-1

SDG: KPS098

Client Sample ID: BSA-MW-1S-1113

Date Collected: 11/05/13 10:20 Date Received: 11/06/13 09:37 Lab Sample ID: 680-95841-1

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	920000		10000		ug/L			11/13/13 17:35	10000
Chlorobenzene	10000	U	10000		ug/L			11/13/13 17:35	10000
1,2-Dichlorobenzene	10000	U	10000		ug/L			11/13/13 17:35	10000
1,3-Dichlorobenzene	10000	U	10000		ug/L			11/13/13 17:35	10000
1,4-Dichlorobenzene	10000	U	10000		ug/L			11/13/13 17:35	1000
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fa
4-Bromofluorobenzene	107	#LAUROVATEST-7-117-7-117-7-117-7-117-7-117-7-117-7-117-7-117-7-117-7-117-7-117-7-117-7-117-7-117-7-117-7-117-7	70 - 130					11/13/13 17:35	1000
Dibromofluoromethane	97		70 - 130					11/13/13 17:35	1000
Toluene-d8 (Surr)	91		70 - 130					11/13/13 17:35	10000
Method: RSK-175 - Dissolve	ed Gases (GC)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Ethane	1.1	U	1.1		ug/L		· · · · · · · · · · · · · · · · · · ·	11/08/13 13:35	
Ethylene	1.0	U	1.0		ug/L			11/08/13 13:35	
Methane (TCD)	7000		0.58		ug/L			11/08/13 13:35	
Method: 6010C - Metais (ICi	ଦ) - Total Recoverat	ole							
Analyte		Qualifier	RL	M:DL	Unit	D	Prepared	Analyzed	Dil Fa
Iron	8.3	***************************************	0.050		mg/L		11/08/13 11:32	11/11/13 23:01	***************************************
Manganese 、	0.87		0.010	•	mg/L		11/08/13 11;32	11/11/13 23;01	
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Chloride	100	**************************************	1.0	***************************************	mg/L			11/13/13 13:25	
Nitrate as N	0.050	U	0.050		mg/L			11/06/13 14:38	
Sulfate	5.0	UUJ	5.0		mg/L			11/08/13 12:34	
Total Organic Carbon	7.2		1.0		mg/L			11/14/13 15:14	
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fa
Alkalinity	760		5.0		mg/L			11/14/13 17:01	

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Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95841-1

SDG: KPS098

Client Sample ID: BSA-MW-1S-F(0.2)-1113

Date Collected: 11/05/13 10:20 Date Received: 11/06/13 09:37 Lab Sample ID: 680-95841-2

Matrix: Water

Method: 6010C - Metals (ICP) -	Dissolved								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	8.2	¥,	0.050		mg/L	***************************************	11/08/13 11:32	11/11/13 23:24	1
Manganese, Dissolved	0.87		0.010		mg/L		11/08/13 11:32	11/11/13 23:24	1
General Chemistry - Dissolved									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	6.7	1	1.0		mg/L			11/13/13 17:42	1

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Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95841-1

SDG: KPS098

Client Sample ID: CPA-MW-1D-1113

Date Collected: 11/05/13 13:45 Date Received: 11/06/13 09:37 Lab Sample ID: 680-95841-3

Matrix: Water

Analyte	ganic Compounds ( Result	Qualifier	RL	MOL	Unit	D	Prepared	Analyzed	Dil Fa
Benzene	9300		250		ug/L			11/13/13 18:07	25
Chlorobenzene	23000		250		ug/L			11/13/13 18:07	25
1,2-Dichlorobenzene	21000		250		ug/L			11/13/13 18:07	25
1,3-Dichlorobenzene	1900		250		ug/L			11/13/13 18:07	25
1,4-Dichlorobenzene	15000		250		ug/L			11/13/13 18:07	25
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fa
4-Bromofluorobenzene	110		70 - 130					11/13/13 18:07	25
Dibromofluoromethane	96		70 - 130					11/13/13 18:07	25
Toluene-d8 (Surr)	99		70 - 130					11/13/13 18:07	25
Method: RSK-175 - Dissolve	ed Gases (GC)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Ethan <i>e</i>	1.1	U	1,1		ug/L			11/08/13 17:39	***********
Ethylene	1.0	U	1.0		ug/L			11/08/13 17:39	
Methane	0.58	U	0.58		ug/L			11/08/13 17:39	
Method: 6010C - Metals (ICI	P) - Total Recoverat	ole							
Analyte	Result	Qualifier	RL	MDL	Unit	Đ	Prepared	Analyzed	Dil Fa
ron	0.20		0.050		mg/L		11/08/13 11:32	11/11/13 23:29	
					mg/L		11/08/13 11:32	11/11/13 23:29	
Manganese	. 0.036		. 0.010		mg/L				
•	. 0.036		、0.010		mg/L	•			•
General Chemistry		Qualifier	, 0.010 RL	₩DL	ŭ	D	Prepared	Analyzed	Dil Fa
General Chemistry Analyte		Qualifier		MDL	ŭ	D	Prepared	Analyzed 11/13/13 15:02	
General Chemistry Analyte Chloride	Result		RL	MDL	Unit	D Annual	Prepared	Monthly was a series of the se	***************************************
General Chemistry Analyte Chloride Vitrate as N	Result	U	RL 2.0	MDL	Unit mg/L	D.	Prepared	11/13/13 15:02	***************************************
General Chemistry Analyte Chloride Vitrate as N Sulfate	Result 100 0.050	U	RL 2.0 0.050	MDL	Unit mg/L mg/L	D.	Prepared	11/13/13 15:02 11/06/13 14:52	Second Section (Section (Sec
General Chemistry Analyte Chloride Nitrate as N Sulfate Fotal Organic Carbon	Result 100 0.050 5.0	U	RL 2.0 0.050 5.0		Unit mg/L mg/L mg/L	D D	Prepared Prepared	11/13/13 15:02 11/06/13 14:52 11/08/13 11:28	Washing & Walled and Administration
Manganese  General Chemistry  Analyte  Chloride  Nitrate as N  Sulfate  Total Organic Carbon  Analyte	Result 100 0.050 5.0	U	RL 2.0 0.050 5.0 1.0		Unit mg/L mg/L mg/L mg/L	karinoitikkini	<u> </u>	11/13/13 15:02 11/06/13 14:52 11/08/13 11:28 11/14/13 15:39	Dil Fa

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DEC 0 5 2013

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95841-1

SDG: KPS098

Client Sample ID: CPA-MW-1D-F(0.2)-1113

Date Collected: 11/05/13 13:45 Date Received: 11/06/13 09:37 Lab Sample ID: 680-95841-4

Matrix: Water

Method: 6010C - Metals (ICP) - Diss	olved								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	0.070	***************************************	0.050		mg/L	V. 20.00	11/08/13 11:32	11/11/13 23:33	1
Manganese, Dissolved	0.026		0.010		mg/L		11/08/13 11:32	11/11/13 23:33	1
Consert Chamister Disease of									

General Chemistry - Dissolved
Analyte

 Analyte
 Result
 Qualifier
 RL
 MDL
 Unit
 D
 Prepared
 Analyzed
 Dil Fac

 Dissolved Organic Carbon
 10
 1.0
 mg/L
 11/13/13 17:56
 1

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NEC 0 5 2013

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95841-1

SDG: KPS098

Client Sample ID: CPA-MW-2D-1113

Date Collected: 11/05/13 12:05 Date Received: 11/06/13 09:37 Lab Sample ID: 680-95841-5

Matrix: Water

Method: 8260B - Volatile Or Analyte	•	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	610	***************************************	250		ug/L		****	11/13/13 18:37	250
Chlorobenzene	36000		250		ug/L			11/13/13 18:37	250
1,2-Dichlorobenzene	640		250		ug/L			11/13/13 18:37	250
1,3-Dichtorobenzene	600		250		ug/L			11/13/13 18:37	250
1,4-Dichlorobenzene	11000		250		ug/L			11/13/13 18:37	250
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	104		70 - 130				32.333333	11/13/13 18:37	250
Dibromofluoromethane	101		70 - 130					11/13/13 18:37	250
Toluene-d8 (Suπ)	95		70 - 130					11/13/13 18:37	250
Method: RSK-175 - Dissolve	ed Gases (GC)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	2.0		1.1		ug/L			11/08/13 17:26	1
Ethylene	1.0	ีย	1.0		ug/L			11/08/13 17:26	1
Methane (TCD)	850		0.58		ug/L			11/08/13 17:26	1
Method: 6010C - Metals (ICI	P) - Total Recoverat	ole							
Analyte	•	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	6.4	F744 1122000 21200 1200 F797177 1770	0.050		mg/L	***************************************	11/08/13 11:32	11/11/13 23:38	1
Manganese	0.36		0.010		mg/L		11/08/13 11:32	11/11/13 23:38	1
General Chemistry									
	Result	Qualifier	RL	MDL	Unit	Ð	Prepared	Analyzed	Dil Fac
Analyte					mg/L			11/13/13 13:35	1
	48		1.0					11/06/13 14:40	
Chloride	<b>48</b> 0.050	U	1.0 0.050		mg/L			11100/1017.70	1
Chloride Nitrate as N		U			mg/L mg/L			11/08/13 12:38	
Chloride Nitrate as N Sulfate	0.050	U	0.050		-				
Chloride Nitrate as N Sulfate Total Organic Carbon	0.050 59 8.8	U Qualifier	0.050 25	RL	mg/L	D	Prepared	11/08/13 12:38	5
Analyte Chloride Nitrate as N Sulfate Total Organic Carbon Analyte Alkalinity	0.050 59 8.8		0.050 25 1.0	RL	mg/L mg/L	D	Prepared	11/08/13 12:38 11/14/13 15:53	Dil Fac

DEC 0 5 50,13

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95841-1

SDG: KPS098

Client Sample ID: CPA-MW-2D-1113-AD

Date Collected: 11/05/13 12:05 Date Received: 11/06/13 09:37

Lab Sample ID: 680-95841-6 Matrix: Water

Method: 8260B - Volatile O	rganic Compounds	(GC/MS)							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	640		250		ug/L			11/13/13 19:09	250
Chlorobenzene	3500 <b>0</b>		250		ug/L			11/13/13 19:09	250
1,2-Dichlorobenzene	730		250		ug/L			11/13/13 19:09	250
1,3-Dichlorobenzene	500		250		ug/L			11/13/13 19:09	250
1,4-Dichlorobenzene	11000		250		ug/L			11/13/13 19:09	250
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	107		70 - 130					11/13/13 19:09	250
Dibromofluoromethane	96		70 - 130					11/13/13 19:09	250
Toluene-d8 (Surr)	101		70 - 130					11/13/13 19:09	250

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95841-1

SDG: KPS098

Client Sample ID: CPA-MW-2D-F(0.2)-1113

Date Collected: 11/05/13 12:05 Date Received: 11/06/13 09:37

Lab Sample ID: 680-95841-7

Matrix: Water

Method: 6010C - Metals (ICP) - Dis	solved								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	7.0		0.050		mg/L	****	11/08/13 11:32	11/11/13 23:43	1
Manganese, Dissolved	0.40		0.010		mg/L		11/08/13 11:32	11/11/13 23:43	1
General Chemistry - Dissolved									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	7.9		1.0		mg/L		100000	11/13/13 18:11	1

Client: Solutia Inc.

Dibromofluoromethane

Toluene-d8 (Surr)

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95841-1

SDG: KPS098

Client Sample ID: CPA-MW-1D-1113-EB

Date Collected: 11/05/13 12:50 Date Received: 11/06/13 09:37 Lab Sample ID: 680-95841-8

11/13/13 13:34

11/13/13 13:34

Matrix: Water

Method: 8260B - Volatile Org	anic Compounds (GC/MS)						
Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Benzene	20	1.0	ug/L			11/13/13 13:34	1
Chlorobenzene	9.8	1.0	ug/L			11/13/13 13:34	1
1,2-Dichlorobenzene	1.0 U	1.0	ug/L			11/13/13 13:34	1
1,3-Dichlorobenzene	1.0_U	1.0	ug/L			11/13/13 13:34	1
1,4-Dichlorobenzene	10	1.0	ug/L			11/13/13 13:34	1
Surrogate	%Recovery Qualifier	Limits			Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	105	70 - 130				11/13/13 13:34	1

70 - 130

70 - 130

107

91

8

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95841-1

SDG: KPS098

Client Sample ID: BSA-MW-3D-1113

Date Collected: 11/05/13 15:20 Date Received: 11/06/13 09:37

Lab Sample ID: 680-95841-9

Matrix: Water

Method: 8260B - Volatile Or Analyte	•	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	90	7	50		ug/L			11/13/13 19:38	50
Chlorobenzene	2400	J	50		ug/L			11/13/13 19:38	50
1.2-Dichlorobenzene	50	U	50		ug/L			11/13/13 19:38	50
1,3-Dichlorobenzene	50	U	50		ug/L			11/13/13 19:38	50
1,4-Dichlorobenzene	350		50		ug/L			11/13/13 19:38	50
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	107		70 - 130					11/13/13 19:38	50
Dibromofluorom <b>e</b> thane	104		70 - 130					11/13/13 19:38	50
Toluene-d8 (Surr)	88		70 - 130					11/13/13 19:38	50
Method: RSK-175 - Dissolve	ed Gases (GC)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	3.3		1.1		ug/L			11/08/13 17:13	
Ethylene	1.0	U	1,0		ug/L			11/08/13 17:13	1
Methane (TCD)	1900		0.58		ug/L			11/08/13 17:1 <b>3</b>	1
Method: 6010C - Metals (ICI	P) - Total Recoverat	ole							
Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	10		0.050		mg/L		11/08/13 11:32	11/11/13 23:47	1
Manganese .	0,52		0.010		mg/L		11/08/13 11:32 ,	11/11/13 23:47	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	120		2.0		mg/L		,	11/13/13 15:02	2
Nitrate as N	0.050	U	0.050		mg/L			11/06/13 14:47	
Sulfate	64		25		mg/L			11/08/13 12:40	
Total Organic Carbon	3.4		1.0		mg/L			11/14/13 16:09	
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	440		5.0		mg/L			11/14/13 17:28	

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95841-1

SDG: KPS098

Client Sample ID: BSA-MW-3D-F(0.2)-1113

Date Collected: 11/05/13 15:20 Date Received: 11/06/13 09:37 Lab Sample ID: 680-95841-10

Matrix: Water

Method: 6010C - Metals (ICP) - Disse	olved								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	10		0,050		mg/L		11/08/13 11:32	11/11/13 23:52	1
Manganese, Dissolved	0.53		0.010		mg/L		11/08/13 11:32	11/11/13 23:52	1
General Chemistry - Dissolved									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	3.6		1.0		mg/L			11/13/13 18:27	1

Client: Solutia Inc.

Toluene-d8 (Surr)

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

92

TestAmerica Job ID: 680-95841-1

SDG: KPS098

Client Sample ID: 4Q13 LTM Trip Blank #2

Date Collected: 11/05/13 00:00 Date Received: 11/06/13 09:37 Lab Sample ID: 680-95841-11

11/13/13 14:04

Matrix: Water

Method: 8260B - Volatile Or	ganic Compounds	(GC/MS)							
Analyte	Result	Qualifier	RL	MDL Uni	t	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	Ü	1.0	ug/i	Ĺ		^^~~	11/13/13 14:04	1
Chlorobenzene	1.0	U	1.0	ug/	L			11/13/13 14:04	1
1,2-Dichlorobenzene	1.0	U	1.0	ug/	L			11/13/13 14:04	1
1,3-Dichlorobenzene	1.0	U	1.0	ug/l	L			11/13/13 14:04	1
1,4-Dichlorobenzene	1.0	U	1.0	ug/l	L			11/13/13 14:04	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	104	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	70 - 130					11/13/13 14:04	1
Dibromofluoromethane	103		70 - 130					11/13/13 14:04	1

70 - 130

8

### **Surrogate Summary**

Client: Solutia Inc.

TestAmerica Job ID: 680-95841-1

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

SDG: KP\$098

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water Prep Type: Total/NA

				Percent Surro	ogate Recovery (Acceptance Limits)
		BFB	DBFM.	TOL	
Lab Sample ID	Client Sample ID	(70-130)	(70-130)	(70-130)	
680-95841-1	BSA-MW-1S-1113	107	97	91	
680-95841-3	CPA-MW-1D-1113	110	96	99	
680-95841-5	CPA-MW-2D-1113	104	101	95	
680-95841-6	CPA-MW-2D-1113-AD	107	96	101	
580-95841-8	CPA-MW-1D-1113-EB	105	107	91	•
680-95841-9	BSA-MW-3D-1113	107	104	88	
680-95841-11	4Q13 LTM Trip Blank #2	104	103	92	
LCS 680-302958/4	Lab Control Sample	100	107	98	
LCSD 680-302958/5	Lab Control Sample Dup	107	100	104	
MB 680-302958/8	Method Blank	108	106	92	

Surrogate Legend

BFB = 4-Bromofluorobenzene

DBFM = Dibromofluoromethane

TOL = Toluene-d8 (Surr)

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Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95841-1

SDG: KPS098

### Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 680-302958/8

Matrix: Water

Analyte
Benzene
Chlorobenzene
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene

Analysis Batch: 302958

Client Sample ID: Method Blank
Prep Type: Total/NA

мв	MB							
Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1.0	U	1,0		ug/L			11/13/13 12:33	1
1.0	U	1.0		ug/L			11/13/13 12:33	1
1,0	U	1,0		ug/L			11/13/13 12:33	1
1,0	U	1.0		ug/L			11/13/13 12:33	1
1.0	U	1.0		ug/L			11/13/13 12:33	1

MB MR Prepared Analyzed Dil Fac Surrogate %Recovery Qualifier Limits 4-Bromofluorobenzene 108 70 - 130 11/13/13 12:33 Dibromofluoromethane 106 70 - 130 11/13/13 12:33 Toluene-d8 (Surr) 92 70 - 130 11/13/13 12:33

Lab Sample ID: LCS 680-302958/4

Matrix: Water

Analysis Batch: 302958

Client Sample ID	: Lab Control Sample
	Prep Type: Total/NA

-	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Benzene	50.0	48.4	h	ug/L		97	74 - 123	
Chlorobenzene	50,0	55.7		ug/L		111	79 - 120	
1,2-Dichlorobenzene	50.0	46.9		ug/L	1	94	77 - 124	•
1,3-Dichlorobenzene	50.0	49.5		ug/L		99	79 - 123	
1,4-Dichlorobenzene	50.0	48.7		ug/L		97	76 - 124	

 Surrogate
 %Recovery
 Qualifier
 Limits

 4-Bromofluorobenzene
 100
 70 - 130

 Dibromofluoromethane
 107
 70 - 130

 Toluene-d8 (Surr)
 98
 70 - 130

Lab Sample ID: LCSD 680-302958/5

Matrix: Water

Analysis Batch: 302958

Client Sample ID: Lab	Control	Sample Dup
	Prep Tv	ne: Total/NA

RPD Spike LCSD LCSD %Rec. Added Result Qualifier Unit %Rec Limits RPD Limit Analyte ug/L 99 74 - 123 30 50.0 49,4 Benzene 112 79 - 120 30 50.0 56.1 ug/L 1 Chiorobenzene 108 77 - 124 14 30 1,2-Dichlorobenzene 50,0 54.0 ug/L 50.0 55.7 ug/L 111 79 - 123 12 30 1,3-Dichlorobenzene 50.0 53.9 ug/L 108 76 - 124 10 30 1,4-Dichlorobenzene

	LCSD	LCSD				
Surrogate	%Recovery	Qualifier	Limits			
4-Bromofluorobenzene	107		70 - 130			
Dibromofluoromethane	100		70 - 130			
Toluene-d8 (Surr)	104		70 - 130			

		Q	, Sairii	nie L	\USu	i LS							
Client; Solutia Inc. Project/Site: WGK Long Term Monitoring	- 4Q13 N	IOV 2013								1	estAme	erica Job ID: 680- SDG:	95841-1 KPS098
Method: RSK-175 - Dissolved Ga													
Welliou. Non-175 - Dissolveu Ga	1565 (00	• ]											
Lab Sample ID: MB 680-302324/3											Client S	Sample ID: Metho	
Matrix: Water												Prep Type: 1	Γotal/NA
Analysis Batch: 302324													
		MB								_			
Analyte		Qualifier		RL		MDL			D	Pi	repared	Analyzed	Dil Fac
Ethane	1.1			1.1			ug/L					11/08/13 11:43	1
Ethylene	1.0			1.0			ug/L					11/08/13 11:43	1
Methane	0.58			0.58			ug/L					11/08/13 11:43	1
Methane (TCD)	0.58	U		0.58			ug/L					11/08/13 11:43	1
Lab Sample ID: LCS 680-302324/10									Cli	ent	Sample	e ID: Lab Control	Sample
Matrix: Water												Prep Type: 1	Total/NA
Analysis Batch: 302324													
			Spike		LCS	LCS						%Rec.	
Analyte			Added		Result	Qua	lifier	Unit		D	%Rec	Limits	
Methane (TCD)			1920	,-,	1920	Barra Verrice		ug/L		10.00	100	75 - 125	
Lab Sample ID: LCS 680-302324/8									Cli	ient	Sample	e ID: Lab Control	Sample
Matrix: Water												Prep Type: 1	
Analysis Batch: 302324													
•			Spike		LCS	LCS						%Rec.	
Analyte			Added		Result	Qua	lifier	Unit		D	%Rec	Limits	
Ethane			288		263		//////	ug/L			91	75 - 125	- MILLIANANIA
Ethylene			269		227			ug/L			84	75 - 125	

Lab Sample ID: LCSD 680-302324/11					Client Sample ID: Lab Control Sample Dup							
	Matrix: Water							Prep I	ype: To	tal/NA		
	Analysis Batch: 302324											
		Spike	LCSD	LCSD				%Rec.		RPD		
- 5	Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit		
Principle (A)	Methane (TCD)	1920	1900		ug/L		99	75 - 125	1	30		

Matrix: Water				Client	sam	ipie ID:	Prep T	ype: To	
Analysis Batch: 302324	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Ethane	288	307	V.V.	ug/L		106	75 - 125	16	30
Ethylene	269	293		ug/L		109	75 - 125	25	30
Methane	154	154		ug/L		100	75 - 125	13	30

Methane	154	154	ug/L	100	75 - 125	13	30
h							
Method: 6010C - Metals (ICP)		5		*************************	***************************************		

Lab Sample ID: MB 680-302362/1-A Matrix: Water Analysis Batch: 302750	мв	мв						mple ID: Metho pe: Total Reco Prep Batch:	verable
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	0.050	U	0.050		mg/L		11/08/13 11:32	11/11/13 22:02	1
Iron, Dissolved	0.050	U	0.050		mg/L		11/08/13 11:32	11/11/13 22:02	1
Manganese	0.010	U	0.010		mg/L		11/08/13 11:32	11/11/13 22:02	1
Manganese, Dissolved	0.010	U	0.010		mg/L		11/08/13 11:32	11/11/13 22:02	1

TestAmerica Savannah

DEC 0 5 2013

Project/Site: WGK Long Term Monitor	ing - 4Q	13 N	OV 2013											SDG: k	(PS09
Tethod: 6010C - Metals (ICP) (	Contin	ued	)	· · · · · · · · · · · · · · · · · · ·	····•					<del></del>					
Lab Sample ID: LCS 680-302362/2- Matrix: Water	A			***************************************	***************************************					Clie	ent S	•	iD: Lab C Type: Tota		•
Analysis Batch: 302750												Freb		Batch:	
Analysis Baton. 502750				Spike		LCS	LCS						%Rec.	Daton.	30230
Analyte				Added		Result		fier	Unit		D	%Rec	Limits		
fron				5,00		4.94		~*~~	mg/L			99	75 - 125		
Iron, Dissolved				5.00		4.94			mg/L			99	75 - 125		
Manganese				0.500		0.500			mg/L			100	75 - 125		
Manganese, Dissolved				0.500		0.500			mg/L			100	75 . 125		
Method: 310.1 - Alkalinity															
Lab Sample ID: MB 680-303380/5											c	Client S	sample ID:	Method	d Blant
Matrix: Water													Prep	Type: To	otal/N
Analysis Batch: 303380		мв	шо												
Analyte	ь		MB Qualifier		RL		RL.	Lloit		D	Dro	pared	Analy	rad	Da E-
Alkalinity	K	5.0	U		5.0			mg/L			Pie	pared	Analy 11/14/13		Dil Fa
Carbon Dioxide, Free		5.0			5.0			mg/L					11/14/13		
					0.0										
Lab Sample ID: LCS 680-303380/6										Clie	ent S	Sample	ID: Lab C		-
Matrix: Water													Prep	Type: To	otai/N
Analysis Batch: 303380				Spike		LCS	LCS						%Rec.		
Analyte				Added		Result		fier .	Unit	•	D	%Rec	Limits		
Alkalinity				250		224		~~~~~	mg/L			90	80 . 120		
Lab Sample ID: LCSD 680-303380/3	12								C	liont S	amr	alo iDe l	Lab Contr	ol Camr	alo Du
Matrix: Water	2								Ų,	aem o	aiiik	JIE IU.		Type: To	
Analysis Batch: 303380				<b>9</b> -24									0/0		-
Analyte				Spike Added		LCSD			Unit			9/ Doo	%Rec. Limits	000	RP
Analyte Aikalinity				250		Result 220	Quali	iler	Unit mg/L		D 	%Rec 88	80 - 120	RPD 2	Lim 3
				200		220			ing/L			00	001120	-	
Lab Sample ID: 680-95841-9 DU										C	lier	ıt Sam	ple ID: BS	A-MW-3	D-111
Matrix: Water													Prep	Type: To	otal/N
Analysis Batch: 303380															
	Sample	Sam	pie			DU	DU								RP
Analyte	Result	Qual	ifier	V0000000000000000000000000000000000000		Result	Quali	fier	Unit		D			RPD	Lim
Alkalinity	440					492			mg/L					11	
Carbon Dioxide, Free	29					34.8			mg/L					19	3
flethod: 325.2 - Chloride															
Lab Sample ID: MB 680-303120/47 Matrix: Water											C	Client S	Sample ID: Prep	: Method Type: To	
Analysis Batch: 303120													. тер	. , , , , , , , , ,	- 441/11/
		МВ	MB												
Analyte	R		Qualifier		RL		MDL	Unit		D	Pre	epared	Analy	/zed	Dil Fa
raining to										_					

Client: Solutia Inc. TestAmerica Job ID: 680-95841-1 Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013 SDG: KPS098 Method: 325.2 - Chloride (Continued) Lab Sample ID: LCS 680-303120/6 Client Sample ID: Lab Control Sample Matrix: Water Prep Type: Total/NA Analysis Batch: 303120 Spike LCS LCS %Rec. Analyte Added Result Qualifier Unit Limits D %Rec Chloride 50.0 50.0 mg/L 100 85 - 115 Method: 353.2 - Nitrogen, Nitrate-Nitrite Lab Sample ID: MB 680-301975/13 Client Sample ID: Method Blank Matrix: Water Prep Type: Total/NA Analysis Batch: 301975 Analyte Result Qualifier RL MDL Unit Prepared Analyzed Dil Fac Nitrate as N 0.050 U 0.050 11/06/13 14:17 mg/L Lab Sample ID: LCS 680-301975/14 Client Sample ID: Lab Control Sample Matrix: Water Prep Type: Total/NA Analysis Batch: 301975 Spike LCS LCS %Rec. Analyte Added Result Qualifier Unit %Rec Limits Nitrate as N 0.497 0.532 90 - 110 mg/L 107 Nitrate Nitrite as N 0.997 1.04 104 90 - 110 mg/L Nitrite as N 0.500 0.505 90 - 110 mg/L 101 Method: 375.4 - Sulfate Lab Sample ID: MB 680-302385/44 Client Sample ID: Method Blank Matrix: Water Prep Type: Total/NA Analysis Batch: 302385 мв мв Analyte Result Qualifier RI MDL Unit D Prepared Analyzed Dil Fac 5.0 Sulfate 5.0 U 11/08/13 13:09 mg/L Lab Sample ID: LCS 680-302385/35 Client Sample ID: Lab Control Sample Matrix: Water Prep Type: Total/NA Analysis Batch: 302385 Spike LCS LCS %Rec. Analyte Added Result Qualifier Unit %Rec Limits Sulfate 20.0 20.1 mg/L 100 75 - 125 Lab Sample ID: 680-95841-1 MS Client Sample ID: BSA-MW-1S-1113 Matrix: Water Prep Type: Total/NA Analysis Batch: 302385 Sample Sample Spike MS MS %Rec. Analyte Result Qualifier Added Result Qualifier Unit %Rec Limits Sulfate 5.0 U 20.0 8.75 F mg/L 44 75 - 125 Lab Sample ID: 680-95841-1 MSD Client Sample ID: BSA-MW-1S-1113 Matrix: Water Prep Type: Total/NA Analysis Batch: 302385 Sample Sample Spike MSD MSD %Rec. RPD Analyte Result Qualifier Added Result Qualifier Unit Limits RPD Limit 5,0 U Sulfate 20.0 10.4 F mg/L 52 75 - 125

		Q	C Samբ	ole F	Resul	ts								
Client: Solutia Inc. Project/Site: WGK Long Term Monitor	ring - 4Q13	NOV 2013								Te	estAme	erica Job ID: 680 SDG		
Method: 375.4 - Sulfate (Conti	nued)													
Lab Sample ID: 680-95841-5 DU									c	lier	ıt Samı	ole ID: CPA-MW	-2D-	1113
Matrix: Water												Prep Type:	Tota	ıl/NA
Analysis Batch: 302385														
	Sample Sa					DU.								RPI
Analyte Sulfate	Result Qu	alifler 			Result 58,5	Quan	mer	Unit mg/L		D 		RF	.5	Lim 3
Surate	39				0,00			mgrc						J
flethod: 415.1 - DOC											.,			
Lab Sample ID: MB 680-303261/6 Matrix: Water										(	Client S	Sample ID: Meth Prep Type: D		
Analysis Batch: 303261														
•	ME	B MB												
Analyte	Resul	t Qualifier		RL		MDL	Unit		D	Pro	epared	Analyzed	- 0	il Fa
Dissolved Organic Carbon	1.0	J U		1.0			mg/L					11/13/13 14:43		
Lab Sample ID: LCS 680-303261/5 Matrix: Water									Cli	ent :	Sample	e ID: Lab Contro Prep Type: D		
Analysis Batch: 303261														
			Spike		LCS	LCS						%Rec.		
Analyte			Added		Result	Qual	ifier	Unit		D	%Rec	Limits		
Dissolved Organic Carbon			20.0		17.3			mg/L			86	80 - 120		
Method: 415.1 - TOC														
Lab Sample ID: MB 680-303389/2										(	Client S	Sample ID: Meth	od B	Blan
Matrix: Water												Prep Type:		
Analysis Batch: 303389												-		
	MI	в мв												
Analyte		t Qualifier		RL		MDL	Unit		D	Pro	epared	Analyzed		Dil Fa
Total Organic Carbon	1.	o U		1.0			mg/L					11/14/13 14:15		
Lab Sample ID: LCS 680-303389/5									Cli	ent	Sample	e ID: Lab Contro	ol Sa	mpl
Matrix: Water												Prep Type:		
Analysis Batch: 303389														
			Spike		LCS	LCS						%Rec.		
Analyt <del>e</del>			Added		Result	Qual	lifier	Unit		Đ	%Rec	Limits		
Total Organic Carbon	<u></u>		20.0		20.0			mg/L			100	80 - 120		
Lab Sample ID: 680-95841-1 DU										Clie	nt Sam	ple ID: BSA-MV	/-1S-	-111
Matrix: Water												Prep Type:	Tota	al/N
Analysis Batch: 303389						_								
	Sample Sa	•				DU				_				RP
Analyte	Result Qu	alifier			Result	Qual	lifier	Unit		D	·····	RI		Lim 2
Total Organic Carbon	7.2				7.06			mg/L					2	

### **QC Association Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95841-1

SDG: KPS098

### GC/MS VOA

Analysis Batch: 302958

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-95841-1	BSA-MW-1S-1113	Total/NA	Water	8260B	***************************************
680-95841-3	CPA-MW-1D-1113	Total/NA	Water	8260B	
680-95841-5	CPA-MW-2D-1113	Total/NA	Water	8260B	
680-95841-6	CPA-MW-2D-1113-AD	Total/NA	Water	8260B	
680-95841-8	CPA-MW-1D-1113-EB	Total/NA	Water	8260B	
680-95841-9	BSA-MW-3D-1113	Total/NA	Water	8260B	
680-95841-11	4Q13 LTM Trip Blank #2	Total/NA	Water	8260B	
LCS 680-302958/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-302958/5	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 680-302958/8	Method Blank	Total/NA	Water	8260B	



Analysis Batch: 302324

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-95841-1	BSA-MW-1S-1113	Total/NA	Water	RSK-175	
680-95841-3	CPA-MW-1D-1113	Total/NA	Water	RSK-175	
680-95841-5	CPA-MW-2D-1113	Total/NA	Water	RSK-175	
680-95841-9	BSA-MW-3D-1113	Total/NA	Water	RSK-175	
LCS 680-302324/10	Lab Control Sample	Total/NA	Water	RSK-175	
LCS 680-302324/8	Lab Control Sample	Total/NA	Water	RSK-175	
LCSD 680-302324/11	Lab Control Sample Dup	Total/NA	` Water	RSK-175	
LCSD 680-302324/9	Lab Control Sample Dup	Total/NA	Water	RSK-175	
MB 680-302324/3	Method Blank	Total/NA	Water	RSK-175	

#### Metals

Prep Batch: 302362

1.					
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-95841-1	BSA-MW-1S-1113	Total Recoverable	Water	3005A	17.231
680-95841-2	BSA-MW-1S-F(0.2)-1113	Dissolved	Water	3005A	
680-95841~3	CPA-MW-1D-1113	Total Recoverable	Water	3005A	
680-95841-4	CPA-MW-1D-F(0.2)-1113	Dissolved	Water	3005A	
680-95841-5	CPA-MW-2D-1113	Total Recoverable	Water	3005A	
680-95841-7	CPA-MW-2D-F(0.2)-1113	Dissolved	Water	3005A	
680-95841-9	BSA-MW-3D-1113	Total Recoverable	Water	3005A	
680-95841-10	BSA-MW-3D-F(0.2)-1113	Dissolved	Water	3005A	
LCS 680-302362/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
MB 680-302362/1-A	Method Blank	Total Recoverable	Water	3005A	

Analysis Batch: 302750

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-95841-1	BSA-MW-1S-1113	Total Recoverable	Water	6010C	302362
680-95841-2	BSA-MW-1S-F(0.2)-1113	Dissolved	Water	6010C	302362
680-95841-3	CPA-MW-1D-1113	Total Recoverable	Water	6010C	302362
680-95841-4	CPA-MW-1D-F(0.2)-1113	Dissolved	Water	6010C	302362
680-95841-5	CPA-MW-2D-1113	Total Recoverable	Water	6010C	302362
680-95841-7	CPA-MW-2D-F(0.2)-1113	Dissolved	Water	6010C	302362
680-95841-9	BSA-MW-3D-1113	Total Recoverable	Water	6010C	302362
680-95841-10	BSA-MW-3D-F(0.2)-1113	Dissolved	Water	6010C	302362

### **QC Association Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95841-1

SDG: KPS098

### Metals (Continued)

Analysis Batch: 302750	(Continued)
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	Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
2000	LCS 680-302362/2-A	Lab Control Sample	Total Recoverable	Water	6010C	302362
	MB 680-302362/1-A	Method Blank	Total Recoverable	Water	6010C	302362

### **General Chemistry**

### Analysis Batch: 301975

	Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
	680-95841-1	BSA-MW-1S-1113	Total/NA	Water	353,2	
	680-95841-3	CPA-MW-1D-1113	Total/NA	Water	353.2	
	680-95841-5	CPA-MW-2D-1113	Total/NA	Water	353.2	
1	680-95841-9	BSA-MW-3D-1113	Total/NA	Water	353.2	
	LCS 680-301975/14	Lab Control Sample	Total/NA	Water	353.2	
1	MB 680-301975/13	Method Blank	Total/NA	Water	353.2	

#### Analysis Batch: 302385

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-95841-1	BSA-MW-1S-1113	Total/NA	Water	375,4	FEOGRAFIA
680-95841-1 MS	BSA-MW-1S-1113	Total/NA	Water	375.4	
680-95841-1 MSD	BSA-MW-1S-1113	Total/NA	Water	375.4	
680-95841-3	CPA-MW-1D-1113	Total/NA	Water	375.4	
680-95841-5	CPA-MW-2D-1113	Total/NA	Water	375.4	
680-95841-5 DU	CPA-MW-2D-1113	Total/NA	Water	375.4	
680-95841-9	BSA-MW-3D-1113	Total/NA	Water	375.4	
LCS 680-302385/35	Lab Control Sample	Total/NA	Water	375.4	
MB 680-302385/44	Method Blank	Total/NA	Water	375.4	

### Analysis Batch: 303120

ľ	Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
	680-95841-1	BSA-MW-1S-1113	Total/NA	Water	325.2	
	680-95841-3	CPA-MW-1D-1113	Total/NA	Water	325.2	
	680-95841-5	CPA-MW-2D-1113	Total/NA	Water	325.2	
	680-95841-9	BSA-MW-3D-1113	Total/NA	Water	325.2	
	LCS 680-303120/6	Lab Control Sample	Total/NA	Water	325.2	
-	MB 680-303120/47	Method Blank	Total/NA	Water	325.2	

### Analysis Batch: 303261

Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method Prep Batch
680-95841-2	BSA-MW-1S-F(0.2)-1113	Disso(ved	Water	415.1
680-95841-4	CPA-MW-1D-F(0.2)-1113	Dissolved	Water	415.1
680-95841-7	CPA-MW-2D-F(0.2)-1113	Dissolved	Water	415.1
680-95841-10	BSA-MW-3D-F(0.2)-1113	Dissolved	Water	415.1
LCS 680-303261/5	Lab Control Sample	Dissolved	Water	415.1
MB 680-303261/6	Method Blank	Dissolved	Water	415.1

#### Analysis Batch: 303380

ĺ	Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
į	680-95841-1	BSA-MW-1S-1113	Total/NA	Water	310.1	
1	680-95841-3	CPA-MW-1D-1113	Total/NA	Water	310.1	
1	680-95841-5	CPA-MW-2D-1113	Total/NA	Water	310.1	
1	680-95841-9	BSA-MW-3D-1113	Total/NA	Water	310.1	

TestAmerica Savannah

DEC \$ 5 2013.

### **QC Association Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95841-1

SDG: KPS098

### General Chemistry (Continued)

Analysis I	Batch:	303380	(Continued)	١
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Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-95841-9 DU	BSA-MW-3D-1113	Total/NA	Water	310.1	
LCS 680-303380/6	Lab Control Sample	Total/NA	Water	310.1	1
LCSD 680-303380/32	Lab Control Sample Dup	Total/NA	Water	310.1	
MB 680-303380/5	Method Blank	Total/NA	Water	310.1	

### Analysis Batch: 303389

Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
680-95841-1	BSA-MW-1S-1113	Total/NA	Water	415.1	
680-95841-1 DU	BSA-MW-1S-1113	Total/NA	Water	415.1	
680-95841-3	CPA-MW-1D-1113	Total/NA	Water	415.1	
680-95841-5	CPA-MW-2D-1113	Total/NA	Water	415.1	
680-95841-9	BSA-MW-3D-1113	Total/NA	Water	415.1	
LCS 680-303389/5	Lab Control Sample	Total/NA	Water	415.1	
MB 680-303389/2	Method Blank	Total/NA	Water	415.1	

TestAmerica Savannah

DEC 4 5 2013

#### Lab Chronicle

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95841-1

SDG: KPS098

Client Sample ID: BSA-MW-1S-1113

Date Collected: 11/05/13 10:20 Date Received: 11/06/13 09:37 Lab Sample ID: 680-95841-1

Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		10000	302958	11/13/13 17:35	JD1	TAL SAV
Total/NA	Analysis	RSK-175		1	302324	11/08/13 13:35	AJMC	TAL SAV
Total Recoverable	Prep	3005A			302362	11/08/13 11:32	BJB	TAL SAV
Total Recoverable	Analysis	6010C		1	302750	11/11/13 23:01	BCB	TAL SAV
Total/NA	Analysis	353.2		1	301975	11/06/13 14:38	CRW	TAL SAV
Total/NA	Analysis	375.4		1	302385	11/08/13 12:34	JME	TAL SAV
Total/NA	Analysis	325.2		1	303120	11/13/13 13:25	JME	TAL SAV
Total/NA	Analysis	310.1		1	303380	11/14/13 17:01	LBH	TAL SAV
Total/NA	Analysis	415.1		1	303389	11/14/13 15:14	CMP	TAL SAV

Client Sample ID: BSA-MW-1S-F(0.2)-1113

Date Collected: 11/05/13 10:20

Date Received: 11/06/13 09:37

Lab Sample ID: 680-95841-2

Matrix: Water

Batch Batch Dilution Batch Prepared Prep Type Туре Method Factor Number or Analyzed Analyst Lab Dissolved Prep 3005A 302362 11/08/13 11:32 BJB TAL SAV Dissolved 6010C TAL SAV Analysis 302750 11/11/13 23:24 ₿¢₿ Dissolved Analysis 415.1 1 303261 11/13/13 17:42 CMP TAL SAV

Client Sample ID: CPA-MW-1D-1113

Date Collected: 11/05/13 13:45

Date Received: 11/06/13 09:37

Lab Sample ID: 680-95841-3

Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Ргер Туре	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Łab
Total/NA	Analysis	8260B		250	302958	11/13/13 18:07	JD1	TAL SAV
Total/NA	Analysis	RSK-175		1	302324	11/08/13 17:39	AJMC	TAL SAV
Total Recoverable	Prep	3005A			302362	11/08/13 11:32	вјв	TAL SAV
Total Recoverable	Analysis	6010C		1	302750	11/11/13 23:29	BCB	TAL SAV
Total/NA	Analysis	353.2		1	301975	11/06/13 14:52	CRW	TAL SAV
Total/NA	Analysis	375.4		1	302385	11/08/13 11:28	JME	TAL SAV
Total/NA	Analysis	325.2		2	303120	11/13/13 15:02	JME	TAL SAV
Total/NA	Analysis	310.1		1	303380	11/14/13 17:11	LBH	TAL SAV
Total/NA	Analysis	415.1		1	303389	11/14/13 15:39	CMP	TAL SAV

Client Sample ID: CPA-MW-1D-F(0.2)-1113

Date Collected: 11/05/13 13:45 Date Received: 11/06/13 09:37 Lab Sample ID: 680-95841-4

Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Ргер Туре	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	3005A	**********		302362	11/08/13 11:32	BJB	TAL SAV
Dissolved	Analysis	6010C		1	302750	11/11/13 23:33	BCB	TAL SAV

#### Lab Chronicle

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95841-1

SDG: KPS098

Client Sample ID: CPA-MW-1D-F(0.2)-1113

Date Collected: 11/05/13 13:45 Date Received: 11/06/13 09:37

Lab Sample ID: 680-95841-4 Matrix: Water

Batch Batch

Dilution Batch Prepared Method Prep Type Factor or Analyzed Type Run Number Analyst Lab. Dissolved 415.1 CMP TAL SAV Analysis 303261 11/13/13 17:56

Lab Sample ID: 680-95841-5

Matrix: Water

Client Sample ID: CPA-MW-2D-1113

Date Collected: 11/05/13 12:05 Date Received: 11/06/13 09:37

Batch Batch Dilution Batch Prepared Prep Type Туре Method Run Factor Number or Analyzed Analyst Lab. Total/NA 8260B Analysis 250 302958 11/13/13 18:37 JD1 TAL SAV Total/NA RSK-175 Analysis AJMC TAL SAV 1 302324 11/08/13 17:26 Total Recoverable Prep 3005A TAL SAV 302362 11/08/13 11:32 B.JB Total Recoverable Analysis 6010C 302750 11/11/13 23:38 BÇB TAL SAV Total/NA Analysis 353.2 301975 11/06/13 14:40 CRW TAL SAV Total/NA Analysis 375.4 JME TAL SAV 5 302385 11/08/13 12:38 Total/NA Analysis 325.2 303120 11/13/13 13:35 .IMF TAL SAV Total/NA Analysis 310.1 303380 11/14/13 17:20 TAL SAV Total/NA Analysis 415.1 303389 11/14/13 15:53 CMP TAL SAV

Client Sample ID: CPA-MW-2D-1113-AD

Date Collected: 11/05/13 12:05 Date Received: 11/06/13 09:37

Lab Sample ID: 680-95841-6

Matrix: Water

1		Batch	Batch		Dilution	Batch	Prepared		
Section Sectio	Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
i	Total/NA	Analysis	8260B		250	302958	11/13/13 19:09	JD1	TAL SAV

Client Sample ID: CPA-MW-2D-F(0.2)-1113

Date Collected: 11/05/13 12:05

Date Received: 11/06/13 09:37

Lab Sample ID: 680-95841-7

Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Ргер Туре	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	3005A		Providence of the Party of the	302362	11/08/13 11:32	BJB	TAL SAV
Dissolved	Analysis	6010C		1	302750	11/11/13 23:43	BCB	TAL SAV
Dissolved	Analysis	415.1		1	303261	11/13/13 18:11	CMP	TAL SAV

Client Sample ID: CPA-MW-1D-1113-EB

Date Collected: 11/05/13 12:50 Date Received: 11/06/13 09:37

Lab Sample ID: 680-95841-8

Matrix: Water

Batch Dilution Batch Batch Prepared Prep Type Type Method Run Factor Number or Analyzed Analyst Lab Analysis Total/NA 8260B 302958 11/13/13 13:34 JD1 TAL SAV

#### Lab Chronicle

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95841-1

SDG: KPS098

Client Sample ID: BSA-MW-3D-1113

Lab Sample ID: 680-95841-9

Matrix: Water

Date Collected: 11/05/13 15:20

Date Received: 11/06/13 09:37

	Batch	Batch		Dilution	Batch	Prepared		
Ргер Туре	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B	**************************************	50	302958	11/13/13 19:38	JD1	TAL SAV
Total/NA	Analysis	RSK-175		1	302324	11/08/13 17:13	AJMC	TAL SAV
Total Recoverable	Prep	3005A			302362	11/08/13 11:32	BJB	TAL SAV
Total Recoverable	Analysis	6010C		1	302750	11/11/13 23:47	BCB	TAL SAV
Total/NA	Analysis	353.2		1	301975	11/06/13 14:47	CRW	TAL SAV
Total/NA	Analysis	375.4		5	302385	11/08/13 12:40	JME	TAL SAV
Total/NA	Analysis	325.2		2	303120	11/13/13 15:02	JME	TAL SAV
Total/NA	Analysis	310.1		1	303380	11/14/13 17:28	LBH	TAL SAV
Total/NA	Analysis	415.1		1	303389	11/14/13 16:09	CMP	TAL SAV

Client Sample ID: BSA-MW-3D-F(0.2)-1113

Date Collected: 11/05/13 15:20

Date Received: 11/06/13 09:37

Lab Sample ID: 680-95841-10

Matrix: Water

Batch Batch Dilution Batch Prepared Prep Type Туре Method Run Factor Number or Analyzed Analyst Lab 3005A TAL SAV Dissolved Prep 302362 11/08/13 11:32 BJB Dissolved Analysis 6010C 302750 11/11/13 23:52 TAL SAV Dissolved Analysis 415.1 303261 11/13/13 18:27 CMP TAL SAV

Client Sample ID: 4Q13 LTM Trip Blank #2

Date Collected: 11/05/13 00:00

Date Received: 11/06/13 09:37

Lab Sample	ID:	680-95841-11
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Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Ргер Туре	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	302958	11/13/13 14:04	JD1	TAL SAV

Laboratory References:

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

TestAmerica Savannah

DEC 0 5 2015

K

TestAmerico

Chain of Custody Record

Savannah, GA 31404 phone 912.354.7858 fax 912.352.0165

5102 LaRoche Avenue

Savannah

260 TestAmerica Laboratories, Inc. 202 Sample Specific Notes: Months 2 4 1 1 1 1 3,1 2 4 2 Sample Disposal ( A fee may be assessed if samples are retained fonger than 1 month) 680-95841 Chain of Custody 11/06/ Date/Time: 000 No. SDG No. Archive For Company: TASAV Disposal By Lab Company company Donoge 20G by 415.1 Dissolved Pe/Mu by 6010C LOC PA 412'1 Site Contact: Michael Corbett Lab Contact: Michele Kersev Return To Client c٦ ra M Liteste by 353.2 ~ ۳ m Dissolved Gases by RSK 175 1 Lare to stallus/s.25. ye obitold. ,--+ \_ Received by: 18/CO2 PA 310/1 ---\_ Тота! Ре/Ми бу 6010С AOCs py 8260B 143 m 'n CI 11/5/13. 16/51 Date/Time: olumed bototill × × Cont Cont 2 H 7 77 Date/Time: TAT if different from Below Standard Water Water Matrix Water Water Water Water Water Water Water Water Water Analysis Turnaround Time Calendar (C) or Work Days (W) Sample Type Project Manager: Bob Billman Ġ Ç Ġ Ġ ψ Ġ Ġ G Ġ Ġ 2 days i week day TeVFax: (314) 743-4108 345 Sample Time 345 SOCI 305 1205 1500 1500 2000 000 OSE! CRS 11/5/13 ison B 11/5/13 Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other Sample Date Company: Company Company: BSA-MW-3D-F10.2)-1113 Skin Irritant Non-Hazard Tlammable Skir 4Q13 LTM Trip Blank # 9 CPR AW-1D 1113-EB CPA-MW-1D-F(0.2)-1113 CPA-MW-2D-F(0.2)-1113 BSA-MW-18-F(0.2)-1113 1001 Highlands Plaza Drive West, Suite 300 CPA-MW-2D-1113-AD BSA-MW-30-1113 Sample Identification CPA-MW-1D-1113 CPA-MW-2D-1113 Phone Project Name: 4Q13 LTM GW Sampling Client Coutact Ϋ́ [ ] Flammable Site: Solutia WG Krummich Facility ossible Hazard Identification St. Louis, MO 63110 URS Corporation (314) 429-0100 (314) 429-0462 Relinquished by: Relinquished by: telinquished by:

### Login Sample Receipt Checklist

Client: Solutia Inc.

Job Number: 680-95841-1

SDG Number: KPS098

List Source: TestAmerica Savannah

Login Number: 95841 List Number: 1

Creator: Banda, Christy S

Question A	nswer Comment
Radioactivity wasn't checked or is = background as measured by a N survey meter.</td <td>/A</td>	/A
The cooler's custody seal, if present, is intact.	rue
Sample custody seals, if present, are intact.	rue
The cooler or samples do not appear to have been compromised or tampered with.	rue
Samples were received on ice.	rue
Cooler Temperature is acceptable.	rue
Cooler Temperature is recorded.	rue
COC is present.	rue
COC is filled out in ink and legible.	rue
COC is filled out with all pertinent information.	гие
Is the Field Sampler's name present on COC?	rue
There are no discrepancies between the containers received and the COC.	rue
Samples are received within Holding Time.	rue
Sample containers have legible labels.	rue
Containers are not broken or leaking.	rue
Sample collection date/times are provided.	rue
Appropriate sample containers are used.	rue
Sample bottles are completely filled.	rue
Sample Preservation Verified.	rue
There is sufficient vol. for all requested analyses, incl. any requested T MS/MSDs	rue
Containers requiring zero headspace have no headspace or bubble is T <6mm (1/4").	rue
Multiphasic samples are not present.	rue
Samples do not require splitting or compositing.	rue
Residual Chlorine Checked.	MA

DEC @ 2 5013

### **Certification Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95841-1

SDG: KPS098

#### Laboratory: TestAmerica Savannah

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
	AFCEE		SAVLAB	
A2LA	DoD ELAP		399.01	02-28-15
A2LA	ISO/IEC 17025		399.01	02-28-15
Alabama	State Program	4	41450	06-30-14
Arkansas DEO	State Program	6	B8-0692	02-01-14
California	NELAP	9	3217CA	07-31-14
Colorado	State Program	8	N/A	12-31-13 *
Connecticut	State Program	1	PH-0161	03-31-15
Florida	NELAP	4	E87052	06-30-14
GA Dept. of Agriculture	State Program	4	N/A	12-31-13 *
Georgia	State Program	4	N/A	06-30-14
Georgia	State Program	4	803	06-30-14
Guam	State Program	9	09-005r	06-17-14
Hawaii	State Program	9	N/A	06-30-14
Illinois	NELAP	5	200022	11-30-13 *
Indiana	State Program	5	N/A	06-30-14
lowa	State Program	7	353	07-01-15
Kentucky	State Program	4	90084	12-31-13 *
Kentucky (UST)	State Program	4	18	06-30-14
Louisiana	NELAP	6	30690	06-30-14
Maine	State Program	1	GA00006	08-16-14
Maryland	State Program	3	250	12-31-13 *
Massachusetts	State Program	1	M-GA006	06-30-14
Michigan	State Program	5	9925	06-30-14
Mississippi	State Program	4	N/A	06-30-14
Montana	State Program	8	CERT0081	01-01-14 *
Nebraska	State Program	7	TestAmerica-Savannah	06-30-14
New Jersey	NELAP	2	GA769	06-30-14
New Mexico	State Program	6	N/A	06-30-14
New York	NELAP	2	10842	04-01-14
North Carolina DENR	State Program	4	269	12-31-13 *
North Carolina DHHS	State Program	4	13701	07-31-14
Okłahoma	State Program	6	9984	08-31-14
Pennsylvania	NELAP	3	68-00474	06-30-14
Puerto Rico	State Program	2	GA00006	01-01-14 *
South Carolina	State Program	4	98001	06-30-14
Tennessee	State Program	4	TN02961	06-30-14
Texas	NELAP	6	T104704185-08-TX	11-30-14
USDA	Federal		SAV 3-04	04-07-14
Virginia	NELAP	3	460161	06-14-14
Washington	State Program	10	C1794	06-10-14
West Virginia	State Program	3	9950C	12-31-13 *
West Virginia DEP	State Program	3	94	06-30-14
Wisconsin	State Program	5	999819810	08-31-14
Wyoming	State Program	8	8TMS-L	06-30-14

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<sup>\*</sup> Expired certification is currently pending renewal and is considered valid.

# Solutia Krummrich Data Review WGK LTM 4Q13

**Laboratory SDG: KPS099** 

Data Reviewer: Melissa Mansker Peer Reviewer: Elizabeth Kunkel

**Date Reviewed: 12/06/2013** 

Guidance: USEPA National Functional Guidelines for Superfund Organic Methods Data Review 2008. USEPA National Functional Guidelines for Superfund

**Inorganic Data Review 2010** 

Work Plan: Revised Long-Term Monitoring Program (LTMP) Work Plan (Solutia

2009)

Sample Identification					
BSA-MW-2D-1113	BSA-MW-2D-F(0.2)-1113				
CPA-MW-3D-1113	CPA-MW-3D-F(0.2)-1113				
BSA-MW-2D-EB	CPA-MW-3D-1113-AD				
4Q13 LTM Trip Blank #3					

### 1.0 Data Package Completeness

Were all items delivered as specified in the QAPP and COC as appropriate?

### 2.0 Laboratory Case Narrative \ Cooler Receipt Form

Were problems noted in the laboratory case narrative or cooler receipt form?

Yes, the laboratory case narrative indicated samples were diluted due to high levels of target analytes. Although not indicated in the laboratory case narrative, VOCs were detected in the equipment blank. These issues are addressed further in the appropriate sections below.

The cooler receipt form indicated that one of one coolers were received by the laboratory at a temperature of 0.6°C, which is outside the 4°C ± 2°C criteria. The samples were received in good condition; therefore no qualification of data was required. Two out of three VOA vials for samples BSA-MW-2D-1113 and CPA-MW-3D-1113 were received by the laboratory with headspace. The remaining vials without headspace contained sufficient sample to complete all requested analyses; therefore no qualification of data was required. Dissolved metals and dissolved organic carbon samples BSA-MW-2D-F(0.2)-1113 and CPA-MW-3DF(0.2)-1113; total metals sample BSA-MW-2D-1113 and CPA-MW-3D-1113; and total organic carbon samples BSA-MW-2D-1113 and BSA-MW-5D-1113 were measured at pH>2. Please see section 11.0 of this review for qualifications due to pH>2.

### 3.0 Holding Times

Were samples extracted/analyzed within applicable limits?

Yes

#### 4.0 Blank Contamination

Were any analytes detected in the Method Blanks, Field Blanks or Trip Blanks?

Yes

Blank ID	Parameter	Analyte	Concentration/Amount
BSA-MW-2D-EB	VOCs	Benzene	9.1 ug/L
BSA-MW-2D-EB	VOCs	Chlorobenzene	4.1 ug/L
BSA-MW-2D-EB	VOCs	1,2-Dichlorobenzene	5.1 ug/L
BSA-MW-2D-EB	VOCs	1,4-Dichlorobenzene	5.9 ug/L

Analytical data reported non-detect or at concentrations greater than five times (5X) the associated blank concentration did not require qualification. No qualification of data was required.

### 5.0 Laboratory Control Sample

Were LCS recoveries within evaluation criteria?

Yes

#### 6.0 Surrogate Recoveries

Were surrogate recoveries within evaluation criteria?

Yes

### 7.0 Matrix Spike and Matrix Spike Duplicate Recoveries

Were MS/MSD samples collected as part of this SDG?

Yes, although not requested, sample BSA-MW-2D-1113 was analyzed for nitrate.

Were MS/MSD recoveries within evaluation criteria?

Yes

### 8.0 Internal Standard (IS) Recoveries

Were internal standard area recoveries within evaluation criteria?

Yes

### 9.0 Laboratory Duplicate Results

Were laboratory duplicate samples collected as part of this SDG?

Yes, sample BSA-MW-2D-1113 was duplicated and analyzed for total organic carbon.

Were laboratory duplicate sample RPDs within criteria?

Yes

### 10.0 Field Duplicate Results

Were field duplicate samples collected as part of this SDG?

Yes

Field ID	Field Duplicate ID
CPA-MW-3D-1113	CPA-MW-3D-1113-AD

Were field duplicates within evaluation criteria?

Yes

### 10.0 Sample Dilutions

For samples that were diluted and nondetect, were undiluted results also reported? Not applicable; analytes were detected in samples that were diluted.

### 11.0 Additional Qualifications

Were additional qualifications applied?

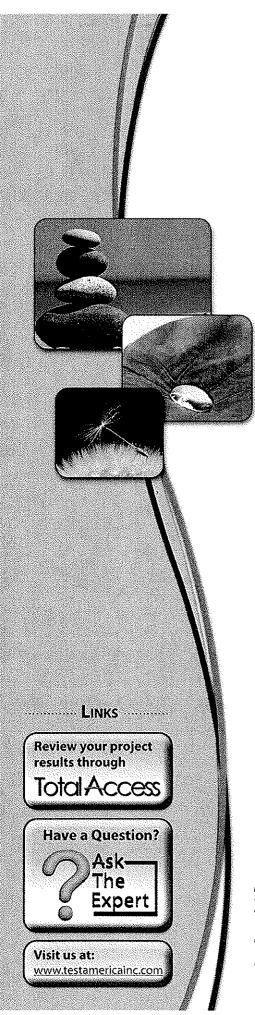
Yes, the following samples are qualified, as summarized below, due to pH > 2.

Sample ID	Parameter	Analyte	Qualification
BSA-MW-2D-1113	Total metals	Iron	J
BSA-MW-2D-1113	Total metals	Manganese	J
BSA-MW-2D-1113	General chemistry	Total organic carbon	J
BSA-MW-2D-F(0.2)-1113	Dissolved metals	Iron	J
BSA-MW-2D-F(0.2)-1113	Dissolved metals	Manganese	J
BSA-MW-2D-F(0.2)-1113	General chemistry	Dissolved organic carbon	J
CPA-MW-3D-1113	Total metals	Iron	J
CPA-MW-3D-1113	Total metals	Manganese	J
CPA-MW-3D-F(0.2)-1113	Dissolved metals	Iron	J
CPA-MW-3D-F(0.2)-1113	Dissolved metals	Manganese	J
CPA-MW-3D-F(0.2)-1113	General chemistry	Dissolved organic carbon	J

### SDG KPS099

Results of Samples from Monitoring Well:

BSA-MW-2D CPA-MW-3D



# **TestAmerica**

THE LEADER IN ENVIRONMENTAL TESTING

## **ANALYTICAL REPORT**

TestAmerica Laboratories, Inc. TestAmerica Savannah 5102 LaRoche Avenue Savannah, GA 31404 Tel: (912)354-7858

TestAmerica Job ID: 680-95908-1

TestAmerica Sample Delivery Group: KPS099

Client Project/Site: WGK Long Term Monitoring - 4Q13 NOV

2013

For: Solutia Inc. 575 Maryville Centre Dr. Saint Louis, Missouri 63141

Attn: Mr. Jerry Rinaldi

Michele KKISEY

Authorized for release by: 11/26/2013 2:42:47 PM

Michele Kersey, Project Manager I (912)354-7858 michele.kersey@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

Reviewed on DEC 0 6 2013,

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95908-1

SDG: KPS099

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#### Case Narrative

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95908-1 SDG: KPS099

Job ID: 680-95908-1

Laboratory: TestAmerica Savannah

Narrative

#### CASE NARRATIVE

Client: Solutia Inc.

Project: WGK Long Term Monitoring - 4Q13 NOV 2013

Report Number: 680-95908-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

#### RECEIPT

The samples were received on 11/7/2013 10:01 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.6° C.

#### Except:

Method(s) 8260B: The following sample(s) was received with headspace in the sample vial: BSA-MW-2D-1113 (680-95908-1), CPA-MW-3D-1113 (680-95908-3). Two vials have headspace in them.

#### VOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples BSA-MW-2D-1113 (680-95908-1), CPA-MW-3D-1113 (680-95908-3), BSA-MW-2D-EB (680-95908-5), CPA-MW-3D-1113-AD (680-95908-6) and 4Q13 LTM Trip Blank # 3 (680-95908-7) were analyzed for Volatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 11/13/2013, 11/14/2013 and 11/15/2013.

Samples BSA-MW-2D-1113 (680-95908-1)[2000X], CPA-MW-3D-1113 (680-95908-3)[100X] and CPA-MW-3D-1113-AD (680-95908-6) [50X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the volatiles analysis.

All quality control parameters were within the acceptance limits.

#### DISSOLVED GASES

Samples BSA-MW-2D-1113 (680-95908-1) and CPA-MW-3D-1113 (680-95908-3) were analyzed for dissolved gases in accordance with RSK-175. The samples were analyzed on 11/10/2013 and 11/11/2013.

No difficulties were encountered during the dissolved gases analysis.

All quality control parameters were within the acceptance limits.

#### METALS (ICP)

Samples BSA-MW-2D-F(0.2)-1113 (680-95908-2) and CPA-MW-3D-F(0.2)-1113 (680-95908-4) were analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 11/08/2013 and analyzed on 11/12/2013.

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#### **Case Narrative**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95908-1

SDG: KPS099

#### Job ID: 680-95908-1 (Continued)

Laboratory: TestAmerica Savannah (Continued)

No difficulties were encountered during the metals analysis.

All quality control parameters were within the acceptance limits.

#### METALS (ICP)

Samples BSA-MW-2D-1113 (680-95908-1) and CPA-MW-3D-1113 (680-95908-3) were analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 11/08/2013 and analyzed on 11/11/2013 and 11/12/2013.

No difficulties were encountered during the metals analysis.

All quality control parameters were within the acceptance limits.

#### <u>ALKALINITY</u>

Samples BSA-MW-2D-1113 (680-95908-1) and CPA-MW-3D-1113 (680-95908-3) were analyzed for alkalinity in accordance with EPA Method 310.1. The samples were analyzed on 11/14/2013.

No difficulties were encountered during the alkalinity analysis.

All quality control parameters were within the acceptance limits.

#### CHLORIDE

Samples BSA-MW-2D-1113 (680-95908-1) and CPA-MW-3D-1113 (680-95908-3) were analyzed for Chloride in accordance with EPA Method 325.2. The samples were analyzed on 11/13/2013.

Samples BSA-MW-2D-1113 (680-95908-1)[2X] and CPA-MW-3D-1113 (680-95908-3)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the chloride analysis.

All quality control parameters were within the acceptance limits.

#### **NITRATE-NITRITE AS NITROGEN**

Samples BSA-MW-2D-1113 (680-95908-1) and CPA-MW-3D-1113 (680-95908-3) were analyzed for nitrate-nitrite as nitrogen in accordance with EPA Method 353.2. The samples were analyzed on 11/07/2013.

No difficulties were encountered during the nitrate-nitrite analysis.

All quality control parameters were within the acceptance limits.

#### SULFATE

Samples BSA-MW-2D-1113 (680-95908-1) and CPA-MW-3D-1113 (680-95908-3) were analyzed for sulfate in accordance with EPA Method 375.4. The samples were analyzed on 11/08/2013.

No difficulties were encountered during the sulfate analysis.

All quality control parameters were within the acceptance limits.

#### TOTAL ORGANIC CARBON

Samples BSA-MW-2D-1113 (680-95908-1) and CPA-MW-3D-1113 (680-95908-3) were analyzed for total organic carbon in accordance with EPA Method 415.1. The samples were analyzed on 11/16/2013.

No difficulties were encountered during the TOC analysis.

All quality control parameters were within the acceptance limits.

DEC 0 & 2013

#### **Case Narrative**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95908-1 SDG: KPS099

Job ID: 680-95908-1 (Continued)

Laboratory: TestAmerica Savannah (Continued)

#### DISSOLVED ORGANIC CARBON (DOC)

Samples BSA-MW-2D-F(0.2)-1113 (680-95908-2) and CPA-MW-3D-F(0.2)-1113 (680-95908-4) were analyzed for Dissolved Organic Carbon (DOC) in accordance with EPA Method 415.1. The samples were analyzed on 11/13/2013.

No difficulties were encountered during the DOC analysis.

All quality control parameters were within the acceptance limits.

## **Sample Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95908-1

SDG: KPS099

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-95908-1	BSA-MW-2D-1113	Water	11/06/13 11:55	11/07/13 10:01
680-95908-2	BSA-MW-2D-F(0.2)-1113	Water	11/06/13 11:55	11/07/13 10:01
680-95908-3	CPA-MW-3D-1113 🗸 🎤	Water	11/06/13 14:20	11/07/13 10:01
680-95908-4	CPA-MW-3D-F(0.2)-1113	Water	11/06/13 14:20	11/07/13 10:01
680-95908-5	BSA-MW-2D-EB 🖍	Water	11/06/13 10:45	11/07/13 10:01
680-95908-6	CPA-MW-3D-1113-AD	Water	11/06/13 14:20	11/07/13 10:01
680-95908-7	4Q13 LTM Trip Blank # 3	Water	11/06/13 00:00	11/07/13 10:01

## **Method Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95908-1

SDG: KPS099

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SAV
RSK-175	Dissolved Gases (GC)	RSK	TAL SAV
6010C	Metals (ICP)	SW846	TAL SAV
310.1	Alkalinity	MCAWW	TAL SAV
325.2	Chloride	MCAVW	TAL SAV
353.2	Nitrogen, Nitrate-Nitrite	MCAVW	TAL SAV
375.4	Sulfate	MCAWW	TAL SAV
415.1	тос	MCAWW	TAL SAV
415.1	DOC	MCAWW	TAL SAV

#### Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

RSK = Sample Prep And Calculations For Dissolved Gas Analysis In Water Samples Using A GC Headspace Equilibration Technique, RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Łab

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

DEC 6 & 2013

## **Definitions/Glossary**

Client: Solutia Inc. Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013 TestAmerica Job ID: 680-95908-1

SDG: KPS099

Qualifiers

GC/MS VOA

Qualifier Qualifier Description

Indicates the analyte was analyzed for but not detected.

GC VOA

Qualifier Qualifier Description

Indicates the analyte was analyzed for but not detected.

Metals

Qualifier Qualifier Description

Ũ Indicates the analyte was analyzed for but not detected.

**General Chemistry** 

Qualifier Qualifier Description

Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation These commonly used abbreviations may or may not be present in this report.

Listed under the "D" column to designate that the result is reported on a dry weight basis

%R Percent Recovery CNF Contains no Free Liquid

DER Duplicate error ratio (normalized absolute difference)

Dil Fac

DL, RA, RE, IN Indicates a Dilution, Re-analysis, Re-extraction, or additional initial metals/anion analysis of the sample

DLC Decision level concentration MOA Minimum detectable activity EDL Estimated Detection Limit MDC Minimum detectable concentration

MDL Method Detection Limit ML Minimum Level (Dioxin) NC Not Calculated

ND Not detected at the reporting limit (or MDL or EDL if shown)

PQL Practical Quantitation Limit

QC Quality Control RER Relative error ratio

Reporting Limit or Requested Limit (Radiochemistry) RL

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin) TEQ Toxicity Equivalent Quotient (Dioxin)

> DEC 0 6 ac. TestAmerica Savannah

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## **Detection Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95908-1

Lab Sample ID: 680-95908-1

Lab Sample ID: 680-95908-3

Lab Sample ID: 680-95908-4

Lab Sample ID: 680-95908-5

SDG: KPS099

Client Sample ID: BSA-MW-2D-1113	
----------------------------------	--

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	100000		2000		ug/L	2000	_	8260B	Total/NA
Ethane	14		1.1		ug/L	1		RSK-175	Total/NA
Methane (TCD)	11000	. 4"	0.58		ug/L	1		RSK-175	Total/NA
Iron	3,6	J	0.050		mg/L	1		6010C	Total
Manganese	0.55	2	0.010		mg/L	1		6010C	Recoverable Total Recoverable
Chloride	100		2.0		mg/L	2		325.2	Total/NA
Total Organic Carbon	6.1	J	1.0		mg/L	1		415.1	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Alkalinity	650		5.0		mg/L	1	2277	310.1	Total/NA
Carbon Dioxide, Free	30		5.0		mg/L	1		310.1	Total/NA

## Client Sample ID: BSA-MW-2D-F(0.2)-1113

Client	Client Sample ID: BSA-MW-2D-F(0.2)-1113							Lab Sample ID: 680-95908-				
Analyte	•	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Ргер Туре		
Iron, Di	ssolved	3.7	J.	0.050		mg/L	1		6010C	Dissolved		
Mangai	nese, Dissolved	0.56	5	0.010		mg/L	1		6010C	Dissolved		
Dissolv	ed Organic Carbon	5.5	2	1.0		mg/L	1		415.1	Dissolved		

## Client Sample ID: CPA-MW-3D-1113

Analyte	Result	Qualifier	、 RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	3800		100		ug/Ł	100	-	8260B	Total/NA
Chlorobenzene	290		100		ug/L	100		8260B	Total/NA
Ethane	22		1.1		ug/L	1		RSK-175	Total/NA
Methane (TCD)	20000		0.58		ug/L	1		RSK-175	Total/NA
Iron	12	J	0.050		mg/L	1		6010C	Total
Manganese	0.74	T	0.010		mg/L	1		6010C	Recoverable Total Recoverable
Chloride	310		5.0		mg/L	5		325.2	Total/NA
Total Organic Carbon	8.2		1.0		mg/L	1		415.1	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Alkalinity	620		5.0		mg/L	1		310.1	Total/NA
Carbon Dioxide, Free	42		5.0		mg/L	1		310.1	Total/NA

## Client Sample ID: CPA-MW-3D-F(0.2)-1113

f"'									
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron, Dissolved	12	J	0.050		mg/L	1		6010C	Dissolved
Manganese, Dissolved	0.72	- The	0.010		mg/L	1		6010C	Dissolved
Dissolved Organic Carbon	8.2	2	1.0		mg/L	1		415.1	Dissolved

## Client Sample ID: BSA-MW-2D-EB

-
rep Type
otal/NA
otal/NA
otal/NA
otal/NA
0

This Detection Summary does not include radiochemical test results.

## **Detection Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95908-1

Lab Sample ID: 680-95908-6

SDG: KPS099

Client Sample ID: CPA-MW-3D-1113-AD

Analyte Result Qualifier RL MDL Unit Dil Fac D Method Prep Type Benzene 3700 50 ug/L 50 8260B Total/NA 50 8260B Total/NA Chlorobenzene 300 50 ug/L

Lab Sample ID: 680-95908-7 Client Sample ID: 4Q13 LTM Trip Blank # 3

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Savannah

DEC 0 6 JULY

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95908-1

SDG: KPS099

Client Sample ID: BSA-MW-2D-1113

Date Collected: 11/06/13 11:55 Date Received: 11/07/13 10:01 Lab Sample ID: 680-95908-1

Matrix: Water

Analyte	ganic Compounds Result	(GC/MS) Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	100000		2000		ug/L			11/14/13 18:44	2000
Chlorobenzene	2000	U	2000		ug/L			11/14/13 18:44	2000
1,2-Dichlorobenzene	2000	U	2000		ug/L			11/14/13 18:44	2000
1,3-Dichlorobenzene	2000	U	2000		ug/L			11/14/13 18:44	2000
1,4-Dichlorobenzene	2000	U	2000		ug/L			11/14/13 18:44	2000
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fa
4-Bromofluorobenzene	99		70 . 130					11/14/13 18:44	2000
Dibromofluoromethane	103		70 - 130					11/14/13 18:44	200
Toluene-d8 (Surr)	95		70 - 130					11/14/13 18:44	200
Method: RSK-175 - Dissolve	ed Gases (GC)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Ethane	14		1.1		ug/L			11/10/13 16:54	
Ethylene	1.0	U	1.0		ug/L			11/10/13 16:54	
Methane (TCD)	11000		0.58		ug/L			11/10/13 16:54	•
Method: 6010C - Metals (ICI	P) - Total Recoverat	ole							
Analyte	•	Qualifier	RL.	MDL	Unit	D	Prepared	Analyzed	Dil Fa
A CONTRACTOR OF THE PROPERTY O		**************************************	,		mg/L		11/08/13 11:32	11/11/13 23:57	
Iron	3.6	i i	0.050		mg/L		1 17007 10 11.02	1 17 17 10 20.01	*************
Iron Manganese	. 0.55	Ť	0.050 . 0.010		mg/L		11/08/13 11:32	11/11/13 23:57	
Manganese		J.			-				der in trade of a second control of the second of the seco
Manganese General Chemistry	. 0.55	Qualifier		MD1.	-	D			
Manganese General Chemistry Analyte	. 0.55	. T	. 0.010	MDŁ	mg/L		11/08/13 11:32	11/11/13 23:57	Dil Fa
Manganese General Chemistry Analyte Chloride	. 0.55	Qualifier	. 0.010	MDŁ	mg/L Unit	D	11/08/13 11:32	11/11/13 23:57 Analyzed	Dil Fa
Manganese General Chemistry Analyte Chloride Nitrate as N	. 0.55  Result  100 0.050 5.0	Qualifier U	. 0.010	MDŁ	mg/L Unit mg/L	D	11/08/13 11:32	11/11/13 23:57 Analyzed 11/13/13 15:02	Dil Fa
Manganese General Chemistry Analyte Chloride Nitrate as N Sulfate	. 0.55  Result 100 0.050	Qualifier U	. 0.010  RL 2.0 0.050	MD1.	mg/L Unit mg/L mg/L	D	11/08/13 11:32	Analyzed 11/13/13 15:02 11/07/13 17:24	Dil Fa
Manganese General Chemistry Analyte Chloride Nitrate as N Sulfate Total Organic Carbon	. 0.55  Result 100 0.050 5.0 6.1	Qualifier U	. 0.010  RL 2.0 0.050 5.0		mg/L Unit mg/L mg/L mg/L	D	11/08/13 11:32	Analyzed 11/13/13 15:02 11/07/13 17:24 11/08/13 11:32	Dil Fa
	. 0.55  Result 100 0.050 5.0 6.1	Qualifier U	. 0.010  RL 2.0 0.050 5.0 1.0		mg/L mg/L mg/L mg/L mg/L	dans milds	11/08/13 11:32 Prepared	Analyzed 11/13/13 15:02 11/07/13 17:24 11/08/13 11:32 11/16/13 20:25	Dil Fa

TestAmerica Savannah

DEC 0 8 2013

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95908-1

SDG: KPS099

Client Sample ID: BSA-MW-2D-F(0.2)-1113

Date Collected: 11/06/13 11:55 Date Received: 11/07/13 10:01

Dissolved Organic Carbon

Lab Sample ID: 680-95908-2

Matrix: Water

Method: 6010C - Metais (ICP) - Dis	solved								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	3.7	V	0.050	entigen and the second entire the second	mg/L		11/08/13 11:32	11/12/13 00:01	1
Manganese, Dissolved	0.56	T	0.010		mg/L		11/08/13 11:32	11/12/13 00:01	1
General Chemistry - Dissolved									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	5.5		1.0		mg/L			11/13/13 18:45	1

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95908-1

SDG: KPS099

Client Sample ID: CPA-MW-3D-1113

Date Collected: 11/06/13 14:20 Date Received: 11/07/13 10:01 Lab Sample ID: 680-95908-3

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	3800	,,,,,	100		ug/L			11/13/13 20:40	100
Chlorobenzene	290		100		ug/L			11/13/13 20:40	100
1,2-Dichlorobenzene	100	U	100		ug/L			11/13/13 20:40	100
1,3-Dichlorobenzene	100	U	100		ug/L			11/13/13 20:40	100
1,4-Dichlorobenzene	100	U	100		ug/L			11/13/13 20:40	100
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	105	Lak alak 14 12012-9-1919-19-19-1	70 - 130				an Extra Extra Control Control	11/13/13 20:40	100
Dibromofluoromethane	98		70 - 130					11/13/13 20:40	100
Toluene-d8 (Surr)	94		70 - 130					11/13/13 20:40	100
Method: RSK-175 - Dissolve	ed Gases (GC)								
Analyte	, ,	Qualifier	RL.	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	22		1.1		ug/L			11/11/13 12:27	1
Ethylene	1.0	υ	1.0		ug/L			11/11/13 12:27	1
Methane (TCD)	20000		0.58		ug/L			11/11/13 12:27	1
Method: 6010C - Metals (ICI	D) - Total Pecoveral	Na.							
Analyte	•	Qualifier	RL.	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	12		0.050		mg/L		11/08/13 11:32	11/12/13 00:06	1
Manganese	0.74	Ť.	0.010		mg/L 、		11/08/13 11:32	11/12/13 00:06	1
General Chemistry									
General Chemistry	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
•			management and the second seco		mg/L		·	11/13/13 14:53	5
Analyte	310		5.0					44/07/40 47:00	
Analyte Chloride		U	5.0 0.050		mg/L			11/07/13 17:30	1
Analyte Chloride Nitrate as N	310				•			11/08/13 11:32	1
Analyte Chloride Nitrate as N Sulfate	3 <b>10</b> 0.050		0.050		mg/L				
Analyte Chloride Nitrate as N Sulfate Total Organic Carbon	310 0.050 5.0 8.2		0.050 5.0	RL	mg/L mg/L	D	Prepared	11/08/13 11:32	1
Analyte Chloride Nitrate as N Sulfate Total Organic Carbon Analyte Alkalinity	310 0.050 5.0 8.2	ប	0.050 5.0 1.0	RL	mg/L mg/L mg/L	<u>D</u>	Prepared	11/08/13 11:32 11/16/13 20:50	1 1 Dil Fac

TestAmerica Savannah

DEC 9 6 2013

Client: Solutia Inc.

Analyte

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95908-1

SDG: KPS099

Client Sample ID: CPA-MW-3D-F(0.2)-1113

Date Collected: 11/06/13 14:20 Date Received: 11/07/13 10:01

Dissolved Organic Carbon

Lab Sample ID: 680-95908-4

Analyzed 11/13/13 18:59

Matrix: Water

Method: 6010C - Metals (ICP) - Diss	olved								
Analyte	Result	Qualifier	RL	MDL (	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	12	J	0.050		mg/L	_	11/08/13 11:32	11/12/13 00:20	1
Manganese, Dissolved	0.72	3	0.010	ſ	mg/L		11/08/13 11:32	11/12/13 00:20	1
General Chemistry - Dissolved									

1.0

MDL Unit

mg/L

Result Qualifier

8.2

.

Dil Fac

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95908-1

SDG: KPS099

Client Sample ID: BSA-MW-2D-EB

Date Collected: 11/06/13 10:45 Date Received: 11/07/13 10:01 Lab Sample ID: 680-95908-5

Matrix: Water

	Method: 8260B - Volatile Organic Co	ompounds (GC/MS)							
	Analyte	Result Qualifier	RL	MDL	Unit	Đ	Prepared	Analyzed	Dil Fac
	Benzene	9.1	1.0		ug/L			11/13/13 15:05	1
i	Chlorobenzene	( 4.1 )	1.0		ug/L			11/13/13 15:05	1
į	1,2-Dichlorobenzene	5.1	1.0		ug/L			11/13/13 15:05	1
į	1,3-Dichlorobenzene	1,0 U	1.0		ug/L			11/13/13 15:05	1
	1,4-Dichlorobenzene	5.9	1.0		ug/L			11/13/13 15:05	1
	Furromata	% Page 110 - Ougliffer	Limita				Omnarad	Analusas	Dil Ess

	Surrogate	%Recovery	Qualifier	Limits	Prepared Analyzed	Dil Fac
	4-Bromofluorobenzene	114		70 - 130	11/13/13 15:05	1
11,000,111	Dibromofluoromethane	97		70 . 130	11/13/13 15:05	1
100000	Toluene-d8 (Surr)	93		70 - 130	11/13/13 15:05	1

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Client: Solutia Inc.

4-Bromofluorobenzene

Dibromofluoromethane

Toluene-d8 (Surr)

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95908-1

SDG: KPS099

Client Sample ID: CPA-MW-3D-1113-AD

Date Collected: 11/06/13 14:20 Date Received: 11/07/13 10:01 Lab Sample ID: 680-95908-6

Matrix: Water

Method: 8260B - Volatile Organic	Compounds	(GC/MS)								
Analyte	Result	Qualifier	RL	MDL	Unit		Ð	Prepared	Analyzed	Dil Fac
Benzene	3700	,,,,,	50	***************************************	ug/L	4.4.4	*****	***	11/15/13 19:48	50
Chlorobenzene	300		50		ug/L				11/15/13 19:48	50
1,2-Dichlorobenzene	50	U	50		ug/L				11/15/13 19:48	50
1,3-Dichlorobenzene	50	U	50		ug/L				11/15/13 19:48	50
1,4-Dichlorobenzene	50	U	50		ug/L				11/15/13 19:48	50
Surrogate	%Recovery	Qualifier	l imits					Prepared	Analyzed	Dil Fac

70 - 130

70 - 130

70 - 130

95

102

90

 Prepared
 Analyzed
 Dil Fac

 11/15/13 19:48
 50

 11/15/13 19:48
 50

 11/15/13 19:48
 50

TestAmerica Savannah

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95908-1

SDG: KPS099

Client Sample ID: 4Q13 LTM Trip Blank #3

Date Collected: 11/06/13 00:00 Date Received: 11/07/13 10:01 Lab Sample ID: 680-95908-7

Matrix: Water

Method: 8260B - Volatile Org	anic Compounds (	(GC/MS)						
Analyte	Result	Qualifier	RL	MDL. Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1,0	Ū	1.0	ug/L			11/13/13 14:36	1
Chlorobenzene	1.0	U	1.0	ug/L			11/13/13 14:36	1
1,2-Dichlorobenzene	1.0	U	1.0	ug/L			11/13/13 14:36	1
1,3-Dichlorobenzene	1.0	U	1.0	ug/L			11/13/13 14:36	1
1,4-Dichlorobenzene	1.0	U	1.0	ug/L			11/13/13 14:36	1
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	108	***************************************	70 - 130				11/13/13 14:36	1
Dibromofluoromethane	98		70 - 130				11/13/13 14:36	1
Toluene-d8 (Surr)	95		70 - 130				11/13/13 14:36	1

8

## **Surrogate Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95908-1

SDG: KPS099

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water Prep Type: Total/NA

				Percent Surrogat	le Recovery (Acceptance Limit
		BFB	DBFM	TOL	
ab Sample ID	Client Sample ID	(70-130)	(70-130)	(70-130)	
80-95908-1	BSA-MW-2D-1113	99	103	95	100,000,000
80-95908-3	CPA-MW-3D-1113	105	98	94	
80-95908-5	BSA-MW-2D-EB	114	97	93	
80-95908-6	CPA-MW-3D-1113-AD	95	102	90	
80-95908-7	4Q13 LTM Trip Blank # 3	108	98	95	
CS 680-302958/4	Lab Control Sample	100	107	98	
CS 680-303240/4	Lab Control Sample	106	109	101	
CS 680-303411/4	Lab Control Sample	102	103	97	
CSD 680-302958/5	Lab Control Sample Dup	107	100	104	
CSD 680-303240/12	Lab Control Sample Dup	105	104	102	
CSD 680-303411/5	Lab Control Sample Dup	102	109	100	
IB 680-302958/8	Method Blank	108	106	92	
1B 680-303240/8	Method Blank	92	107	90	
1B 680-303411/9	Method Blank	96	108	90	

BFB = 4-Bromofluorobenzene

DBFM = Dibromofluoromethane

TOL = Toluene-d8 (Surr)

TestAmerica Savannah

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95908-1

SDG: KPS099

## Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 680-302958/8

Matrix: Water

Analysis Batch: 302958

Client Sample	ID: Method Blank
Pr	ep Type: Total/NA

	MB	MB							2000
Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac	Stagon
Benzene	1.0	Ū	1.0	ug/L			11/13/13 12:33	1	
Chlorobenzene	1.0	U	1.0	uġ/L			11/13/13 12:33	1	10000
1,2-Dichlorobenzene	1.0	U	1.0	ug/L			11/13/13 12:33	1	Contract.
1,3-Dichlorobenzene	1.0	U	1.0	ug/L			11/13/13 12:33	1	1000
1,4-Dichlorobenzene	1.0	U	1.0	ug/Ł			11/13/13 12:33	1	000000
	мв	MB							100000000000000000000000000000000000000
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac	2000
4-Bromofluorobenzene	108	***************************************	70 - 130		-		11/13/13 12:33	1	1

Dibromofluoromethane 11/13/13 12:33 106 70 - 130 Toluene-d8 (Surr) 70 - 130 11/13/13 12:33 92

Lab Sample ID: LCS 680-302958/4

Matrix: Water

Analysis Batch: 302958

Client Sample ID: Lab Control Sample Prep Type: Total/NA

	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Benzene	 50.0	48.4		ug/L	_	97	74 - 123	***************************************
Chlorobenzene	50.0	55.7		ug/Ł		111	79 - 120	
1,2-Dichlorobenzene	50.0	46.9		ug/L		· 94	77 - 124	
1,3-Dichlorobenzene	50.0	49.5		ug/L		99	79 - 123	
1,4-Dichlorobenzene	50.0	48.7		ug/L		97	76 - 124	

LCS LCS Surrogate %Recovery Qualifier Limits 4-Bromofluorobenzene 100 70 - 130 Dibromofluoromethane 107 70.130 Toluene-d8 (Surr) 98 70 - 130

Lab Sample ID: LCSD 680-302958/5

Matrix: Water

Analysis Batch: 302958

Client Sample ID: Lab Control Sample Dup Prep Type: Total/NA

Analysis batch. 302300								
	Spike	LCSD	LCSD			%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D %Rec	Limits	RPD	Limit
Benzene .	50.0	49.4	***************************************	ug/L	99	. 74 - 123	2	30
Chlorobenzene	50.0	56.1		ug/L	112	79 - 120	1	30
1,2-Dichlorobenzene	50.0	54.0		ug/L	108	77 . 124	14	30
1,3-Dichlorobenzene	50.0	55.7		ug/L	111	79 - 123	12	30
1,4-Dichlorobenzene	50.0	53.9	1	ug/L	108	76 - 124	10	30

LCSD	LCSD	
%Recovery	Qualifier	Limits
107		70 - 130
100		70 - 130
104		70 - 130
	%Recovery 107 100	100

TestAmerica Savannah

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95908-1

11/14/13 15:28

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Type: Total/NA

SDG: KPS099

#### Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

107

Lab Sample ID: MB 680-303240/8

Matrix: Water

Client Sample ID: Method Blank
Prep Type: Total/NA

Analysis Batch: 303240

	МВ	мв							Š
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0		ug/L			11/14/13 15:28	1
Chlorobenzene	1.0	U	1.0		ug/L			11/14/13 15:28	1
1,2-Dichlorobenzene	1.0	U	1,0		ug/L			11/14/13 15:28	1
1,3-Dichlorobenzene	1.0	υ	1.0		ug/L			11/14/13 15:28	1
1,4-Dichlorobenzene	1.0	U	1.0		ug/L			11/14/13 15:28	1
	мв	мв							
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	92	A A	70 - 130					11/14/13 15:28	1

Toluene-d8 (Surr) 90 70 - 130 11/14/13 15:28 1

Lab Sample ID: LCS 680-303240/4 Client Sample ID: Lab Control Sample

70 - 130

Matrix: Water Analysis Batch: 303240

Dibromofluoromethane

•		Spike	l	CS LCS				%Rec.	
Analyte		Added	Re	ult Qualifier	Unit	D	%Rec	Limits	
Benzene		50.0	-	5.1	ug/L		90	74 - 123	******
Chlorobenzene		50,0	5	5.6	ug/L		111	79 - 120	
1,2-Dichlorobenzene	•	50.0	` 6	9.1	ug/L		118	77 - 124	,
1,3-Dichlorobenzene		50.0		9.8	ug/L		120	79 - 123	
1,4-Dichlorobenzene		50.0	6	0.8	ug/L		122	76 - 124	

 Surrogate
 %Recovery
 Qualifier
 Limits

 4-Bromofluorobenzene
 106
 70 - 130

 Dibromofluoromethane
 109
 70 - 130

 Toluene-d8 (Surr)
 101
 70 - 130

Lab Sample ID: LCSD 680-303240/12

Matrix: Water

Analysis Batch: 303240

ŧ	Allaly 313 Datoll. 300240									
		Spike	LCSD	LCSD			%Rec.		RPD	
	Analyte	Added	Result	Qualifier (	Unit C	%Rec	Limits	RPD	Limit	
	Benzene	50.0	43.4	· ·	ug/L	87	74 - 123	4	30	
	Chlorobenzene	50.0	53,7	ι	ug/L	107	79 - 120	3	30	
	1,2-Dichlorobenzene	50.0	58.0	ι	ug/L	116	77 - 124	2	30	
	1,3-Dichlorobenzene	50.0	59.5	ι	ug/L	119	79 - 123	1	30	
1	1,4-Dichlorobenzene	50.0	59.6	ι	ug/L	119	76 - 124	2	30	

	LCSD	LCSD	
Surrogate	%Recovery	Qualifier	Limits
4-Bromofluorobenzene	105		70 - 130
Dibromofluoromethane	104		70 - 130
Toluene-d8 (Surr)	102		70 - 130

TestAmerica Savannah

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95908-1

SDG: KPS099

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Client Sample ID: Method Blank Lab Sample ID: MB 680-303411/9 Prep Type: Total/NA Matrix: Water

Analysis Batch: 303411

į		MB	MB							
	Analyte	Result	Qualifier	RL	MDL I	Unit	D	Prepared	Analyzed	Dil Fac
-	Benzene	1.0	U	1.0		ug/L			11/15/13 14:39	1
	Chlorobenzene	1.0	U	1.0	(	ug/L			11/15/13 14:39	1
	1,2-Dichlorobenzene	1.0	U	1.0		ug/L			11/15/13 14:39	1
	1,3-Dichlorobenzene	1.0	υ	1.0	(	ug/L			11/15/13 14:39	1
	1,4-Dichtorobenzene	1.0	U	1.0	(	ug/L			11/15/13 14:39	1
		MB	MB							
-	Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac

	mb	mb					8
Surrogate	%Recovery	Qualifier	Limits	Prepared Ana.	•	il Fac	2000
4-Bromofluorobenzene	96		70 - 130	11/15/1	13 14:39	1	200
Dibromofluoromethane	108		70 - 130	11/15/1	13 14:39	1	2
Toluene-d8 (Surr)	90		70 - 130	11/15/1	13 14:39	1	

Lab Sample ID: LCS 680-303411/4

Matrix: Water

Analysis Batch: 303411

Allarysis Datell. 303411							
	Spike	LCS	LCS			%Rec.	
Analyte	Added	Result	Qualifier Unit	D	%Rec	Limits	
Benzene	50.0	43.2	ug/L		86	74 - 123	
Chlorobenzene	50.0	52,6	ug/L		105	79 - 120	
1,2-Dichlorobenzene	50.0	57.7	ug/L	•	115	77 - 124	•
1,3-Dichlorobenzene	50.0	58.2	ug/L		116	79 - 123	
1,4-Dichlorobenzene	50.0	58.4	ug/L		117	76 - 124	

7		LCS	LCS	
	Surrogate	%Recovery	Qualifier	Limits
	4-Bromofluorobenzene	102		70 - 130
	Dibromofluoromethane	103		70 - 130
2 2 2	Toluene-d8 (Surr)	97		70 - 130

Lab Sample ID: LCSD 680-303411/5

Matrix: Water

Analysis Batch: 303411

Client Sample ID: Lab	Control Sample Dup
	Prep Type: Total/NA

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analysis Batch. 303411	Spike	1000	LCSD				%Rec.		RPD
	Shike								
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Benzene	50,0	.44.8		ug/L		. 90	74 - 123	4	30
Chlorobenzene	50.0	54.8		ug/L		110	79 - 120	4	30
1,2-Dichlorobenzene	50.0	55.3		ug/L		111	77 - 124	4	30
1,3-Dichlorobenzene	50.0	56.1		ug/L		112	79 - 123	4	30
1,4-Dichlorobenzene	50.0	56.2		ug/L		112	76 - 124	4	30

	LCSD	LCSD	
Surrogate	%Recovery	Qualifier	Limits
4-Bromofluorobenzene	102		70 - 130
Dibromofluoromethane	109		70 - 130
Toluene-d8 (Surr)	100		70 - 130

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95908-1

SDG: KPS099

Method: RSK-17	5	- Di	ssolv	ed	Gases	(GC)
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Lab Sample ID: MB 680-302484/4

Matrix: Water

Client Sample ID: Method Blank
Prep Type: Total/NA

Analysis Batch: 302484

		MB	MB							
	Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
i	Ethane	1.1	Ü	1.1	1.0000000000000000000000000000000000000	ug/L	 Automit V		11/10/13 12:38	1
	Ethylene	1.0	U	1.0		ug/L			11/10/13 12:38	1
i	Methane	0.58	U	0,58		ug/L			11/10/13 12:38	1
	Methane (TCD)	0,58	U	0.58		ug/L			11/10/13 12:38	1

Lab Sample ID: LCS 680-302484/6

Matrix: Water

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analysis Batch: 302484

	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Ethane	288	288		ug/L		100	75 - 125	 
Ethylene	269	253		ug/L		94	75 - 125	
Methane	154	149		ug/L		97	75 - 125	

Lab Sample ID: LCS 680-302484/7 Client Sample ID: Lab Control Sample
Matrix: Water Prep Type: Total/NA

Analysis Batch: 302484

-	Analysis Batch: 302484								
		Spike	LCS	LCS				%Rec.	
The state of the state of	Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
•	Methane (TCD)	1920	1950		ug/L		101	75 - 125	Annual An

 Lab Sample ID: LCSD 680-302484/8
 Client Sample ID: Lab Control Sample Dup Matrix: Water

 Analysis Batch: 302484
 Spike
 LCSD
 LCSD
 LCSD
 LCSD
 LCSD
 LCSD
 LCSD
 LCSD
 LCSD
 LCSD
 LCSD
 LCSD
 LCSD
 LCSD
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 Analyte
 Added
 Result Qualifier
 Unit
 D %Rec
 Limits
 RPD
 Limit

 Methane (TCD)
 1920
 2040
 ug/L
 106
 75 - 125
 5
 30

Lab Sample ID: LCSD 680-302484/9

Matrix: Water

Analysis Batch: 302484

Spike

LCSD LCSD

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

RPD

	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
thane	288	258	AND AND ADDRESS OF THE PARTY AND	ug/L		89	75 - 125	11	30
Ethylene	269	221		ขg/L		82	75 - 125	14	30
Methane	154	134		ug/L		87	75 - 125	11	30

Lab Sample ID: MB 680-302485/3

Matrix: Water

Client Sample ID: Method Blank
Prep Type: Total/NA

Analysis Batch: 302485

		мв	MB							
	Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Ethane	1.1	Ū	1.1		ug/L			11/11/13 09:53	1
:	Ethylene	1.0	U	1.0		ug/L			11/11/13 09:53	1
-	Methane	0.58	U	0.58		ug/L			11/11/13 09:53	1
	Methane (TCD)	0.58	U	0.58		ug/L			11/11/13 09:53	1

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95908-1

SDG: KPS099

Method: RSK-175 - Dissolved Gases (GC) (Continued)	Method: RSK-175	- Dissolved	Gases	(GC)	(Contin	nued)
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1	Lab Sample ID: LCS 680-302485/4				Clien	t Sample	e ID: Lab Co	ontrol Sample	ŧ
	Matrix: Water						Prep T	ype: Total/NA	
	Analysis Batch: 302485								
		Spike	LCS	LCS			%Rec.		
*********	Analyte	Added	Result	Qualifier Unit	D	%Rec	Limits		
A HAVE	Ethane	288	285	ug/L		99	75 - 125	P1	
*******	Ethylene	269	266	ug/L		99	75 - 125		
201101	Methane	154	144	ug/L		93	75 - 125		

Lab Sample ID: LCS 680-302485/6				CI	ient Sa	ampl	e ID: Lab C	ontrol S	ample
Matrîx: Water							Prep T	ype: To	tal/NA
Analysis Batch: 302485									
	Spike	LCS	LCS				%Rec.		
Analyte	Added	Result	Qualifier	Unit	D %	Rec	Limits		
Methane (TCD)	1920	1920		ua/L		100	75 - 125	Pharmacanara.	*************

Lab Sample ID: LCSD 680-302485/5 Matrix: Water Analysis Batch: 302485				Clier	ıt San	nple ID:	Lab Contro Prep 1	ol Sampl Type: To	,
Analyte	Spike Added		LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ethane	288	287		ug/L		99	75 125	1	30
Ethylene	269	267		ug/L		99	75 - 125	1	30
Methane	154	145		ua/L		95	75 - 125	1	30

Lab Sample ID: LCSD 680-302485/7 Matrix: Water				Client S	Sam	nple ID: I	Lab Contro Prep T	l Samp ype: To	•
Analysis Batch: 302485	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Methane (TCD)	1920	1880		ug/L	_	98	75 - 125	2	30

## Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-302362/1-A

Matrix: Wate	r							Prep Ty	pe: Total Reco	verable
Analysis Bat	ch: 302750								Prep Batch:	302362
		MB	мв							
Analyte		Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron		0.050	Ū	0.050	***************************************	mg/L		11/08/13 11:32	11/11/13 22:02	1
Iron, Dissolved		0.050	U	0.050		mg/L		11/08/13 11:32	11/11/13 22:02	1
Manganese		0.010	U	0.010		mg/L		11/08/13 11:32	11/11/13 22:02	1
Manganese, Dis	solved	0.010	U	0.010		mg/L		11/08/13 11:32	11/11/13 22:02	1

	Lab Sample ID: LCS 680-302362/2-A Matrix: Water Analysis Batch: 302750					Client	•	Type: Tota	ontrol Sample Il Recoverable Batch: 302362
1		Spike	LCS	LCS				%Rec.	
1	Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
- 1	Iron	5.00	4.94		mg/L		99	75 - 125	
-	Iron, Dissolved	5.00	4.94		mg/L		99	75 - 125	
-	Manganese	0.500	0.500		mg/L		100	75 - 125	
-	Manganese, Dissolved	0.500	0.500		mg/L		100	75 - 125	

TestAmerica Savannah

Client Sample ID: Method Blank

										1	estAme	rica Job II	D: 680-9: SDG: K	
dient: Solutia Inc. roject/Site: WGK Long Term Monitoring	- 4Q13 N	OV 2013												
lethod: 310.1 - Alkalinity														
Lab Sample ID: MB 680-303380/5		,									Cliont S	ample ID:	Method	i Riani
Matrix: Water											Onche O		Type: To	
Analysis Batch: 303380												Пер	. <b>y</b> pc. 10	Jeania
Alialysis Batcii. 303300	MB	мв												
Analyte		Qualifier		RL		ÐΙ	Unit		D	Pr	epared	Analy	red	Dil Fa
Alkalinity	5.0	U		5.0			mg/L					11/14/13		
Carbon Dioxide, Free	5.0			5.0			mg/L					11/14/13		
Lab Sample ID: LCS 680-303380/6									CI	ient	Sample	D: Lab C	Control S	Sampl
Matrix: Water											•		Type: To	
Analysis Batch: 303380														
, maryone Baroni access			Spike		LCS	LCS						%Rec.		
Analyte			Added		Result	Qua	lifier	Unit		D	%Rec	Limits		
Alkalinity			250		224			mg/L			90	80 - 120		
Lab Sample ID: LCSD 680-303380/32								С	lient S	Sam	ple ID: i	Lab Contr		
Matrix: Water												Prep	Type: To	otal/N
Analysis Batch: 303380			0				_					N/Dee		00
			Spike		LCSD					_	0/ B	%Rec.	200	RP
Analyte			Added		Result	Qua	lifier	Unit		D	%Rec	Limits	RPD	Lim
Alkalinity													2	3
Chamiley			250		220			mg/L			88	80 - 120	_	
			230		220			mg/L		• • • • • • • • • • • • • • • • • • • •	88	80 - 120		
Method: 325.2 - Chloride Lab Sample ID: MB 680-303120/47			250		220			mg/L				Sample ID	: <b>M</b> ethod	
lethod: 325.2 - Chloride Lab Sample ID: MB 680-303120/47 Matrix: Water			250		220			mg/L		•		Sample ID		
Method: 325.2 - Chloride Lab Sample ID: MB 680-303120/47 Matrix: Water			250		220			mg/L				Sample ID	: <b>M</b> ethod	
Method: 325.2 - Chloride Lab Sample ID: MB 680-303120/47 Matrix: Water		МВ		NATIONAL PROPERTY.				mg/L			Client S	Sample ID Prep	: <b>M</b> ethod Type: To	otal/N
Method: 325.2 - Chloride Lab Sample ID: MB 680-303120/47 Matrix: Water Analysis Batch: 303120	Result	Qualifier		RL		MDL		mg/L	D			Sample ID Prep Anat	: <b>M</b> èthoc Type: To	otal/N
Method: 325.2 - Chloride Lab Sample ID: MB 680-303120/47 Matrix: Water Analysis Batch: 303120 Analyte		Qualifier	,	RL 1.0		MDL	Unit mg/L	mg/L	D		Client S	Sample ID Prep	: <b>M</b> èthoc Type: To	otal/N
Method: 325.2 - Chloride Lab Sample ID: MB 680-303120/47 Matrix: Water Analysis Batch: 303120 Analyte Chlonde	Result	Qualifier				MDL		mg/L		Pr	Client S	Sample ID Prep Anal	: Method Type: To yzed 3 15:15	otal/N
Method: 325.2 - Chloride  Lab Sample ID: MB 680-303120/47  Matrix: Water  Analysis Batch: 303120  Analyte  Chloride  Lab Sample ID: LCS 680-303120/6	Result	Qualifier				MDL		mg/L		Pr	Client S	Sample ID Prep Anal 11/13/1	: Method Type: To yzed 3 15:15	Dil Fa
Method: 325.2 - Chloride  Lab Sample ID: MB 680-303120/47  Matrix: Water  Analysis Batch: 303120  Analyte Chloride  Lab Sample ID: LCS 680-303120/6  Matrix: Water	Result	Qualifier				MDL		mg/L		Pr	Client S	Sample ID Prep Anal 11/13/1	: Method Type: To yzed 3 15:15	Dil Fa
Method: 325.2 - Chloride  Lab Sample ID: MB 680-303120/47  Matrix: Water  Analysis Batch: 303120  Analyte Chloride  Lab Sample ID: LCS 680-303120/6  Matrix: Water	Result	Qualifier					mg/L	mg/L		Pr	Client S	Sample ID Prep  Anal  11/13/1 e ID: Lab (	: Method Type: To yzed 3 15:15	Dil Fa
Method: 325.2 - Chloride  Lab Sample ID: MB 680-303120/47  Matrix: Water Analysis Batch: 303120  Analyte Chloride  Lab Sample ID: LCS 680-303120/6  Matrix: Water Analysis Batch: 303120	Result	Qualifier	Spike		LCS	LCS	mg/L			Pr lient	Client 5 repared Sample	Anal 11/13/1 e ID: Lab ( Prep %Rec.	: Method Type: To yzed 3 15:15	Dil Fa Sampl
Tethod: 325.2 - Chloride  Lab Sample ID: MB 680-303120/47  Matrix: Water Analysis Batch: 303120  Analyte Chloride  Lab Sample ID: LCS 680-303120/6  Matrix: Water Analysis Batch: 303120  Analyte	Result	Qualifier	Spike Added		LCS Resuit	LCS	mg/L	Unit		Pr	Client 5 repared Sample	Anal 11/13/1 e ID: Lab ( Prep %Rec. Limits	: Method Type: To yzed 3 15:15	Dil Fa
Method: 325.2 - Chloride  Lab Sample ID: MB 680-303120/47  Matrix: Water Analysis Batch: 303120  Analyte Chloride  Lab Sample ID: LCS 680-303120/6  Matrix: Water Analysis Batch: 303120  Analyte	Result	Qualifier	Spike		LCS	LCS	mg/L			Pr lient	Client 5 repared Sample	Anal 11/13/1 e ID: Lab ( Prep %Rec.	: Method Type: To yzed 3 15:15	Dil Fa Sampl
flethod: 325.2 - Chloride  Lab Sample ID: MB 680-303120/47  Matrix: Water Analysis Batch: 303120  Analyte Chloride  Lab Sample ID: LCS 680-303120/6  Matrix: Water Analysis Batch: 303120  Analyte Chloride	Result 1.0	Qualifier	Spike Added		LCS Resuit	LCS	mg/L	Unit		Pr lient	Client 5 repared Sample	Anal 11/13/1 e ID: Lab ( Prep %Rec. Limits	: Method Type: To yzed 3 15:15	Dil Fa Sampl
Method: 325.2 - Chloride  Lab Sample ID: MB 680-303120/47  Matrix: Water  Analysis Batch: 303120  Analyte Chloride  Lab Sample ID: LCS 680-303120/6  Matrix: Water  Analysis Batch: 303120  Analyte Chloride  Method: 353.2 - Nitrogen, Nitrate	Result 1.0	Qualifier	Spike Added		LCS Resuit	LCS	mg/L	Unit		Pr lient	Client S repared Sample	Anal 11/13/1 e ID: Lab ( Prep %Rec. Limits	: Method Type: To yzed 3 15:15 Control S Type: To	Dil Fa
Method: 325.2 - Chloride  Lab Sample ID: MB 680-303120/47  Matrix: Water Analysis Batch: 303120  Analyte Chloride  Lab Sample ID: LCS 680-303120/6  Matrix: Water Analysis Batch: 303120  Analyte Chloride  Method: 353.2 - Nitrogen, Nitrate  Lab Sample ID: MB 680-302253/13	Result 1.0	Qualifier	Spike Added		LCS Resuit	LCS	mg/L	Unit		Pr lient	Client S repared Sample	Analy Analy 11/13/1 e ID: Lab ( Prep  %Rec. Limits 85 - 115	: Method Type: To yzed 3 15:15 Control S Type: To	Dit Fa
Tethod: 325.2 - Chloride  Lab Sample ID: MB 680-303120/47  Matrix: Water Analysis Batch: 303120  Analyte Chloride  Lab Sample ID: LCS 680-303120/6  Matrix: Water Analysis Batch: 303120  Analyte Chloride  Tethod: 353.2 - Nitrogen, Nitrate  Lab Sample ID: MB 680-302253/13  Matrix: Water	Result 1.0	Qualifier	Spike Added		LCS Resuit	LCS	mg/L	Unit		Pr lient	Client S repared Sample	Analy Analy 11/13/1 e ID: Lab ( Prep  %Rec. Limits 85 - 115	: Method Type: To yzed 3 15:15 Control S Type: To	Dit Fa
Method: 325.2 - Chloride  Lab Sample ID: MB 680-303120/47  Matrix: Water Analysis Batch: 303120  Analyte Chloride  Lab Sample ID: LCS 680-303120/6  Matrix: Water Analysis Batch: 303120  Analyte Chloride  Method: 353.2 - Nitrogen, Nitrate  Lab Sample ID: MB 680-302253/13  Matrix: Water Analysis Batch: 302253	Result 1.0	Qualifier	Spike Added	1.0	LCS Resuit	LCS Qua	mg/L	Unit	CI	Prilient D	Client S repared Sample %Rec 100	Analy 17/13/14 e ID: Lab ( Prep  *Rec. Limits  85 - 115  Sample ID Prep	: Method Type: To  yzed 3 15:15  Control S Type: To  : Method Type: To	Dit Fa Sampl otal/N
Tethod: 325.2 - Chloride  Lab Sample ID: MB 680-303120/47  Matrix: Water  Analysis Batch: 303120  Analyte Chloride  Lab Sample ID: LCS 680-303120/6  Matrix: Water  Analysis Batch: 303120  Analyte Chloride  Tethod: 353.2 - Nitrogen, Nitrate  Lab Sample ID: MB 680-302253/13  Matrix: Water  Analysis Batch: 302253	Result 1.0 -Nitrite MB Result	Qualifier U	Spike Added 50.0	1.0	LCS Resuit	LCS Qua	mg/L liffer Unit	Unit		Prilient D	Client S repared Sample	Analy 1713/1.  Analy 1713/1.  Box 1715  Analy 1713/1.  Analy 1715  Analy 1715  Analy 1715	: Method Type: To  yzed 3 15:15 Control S Type: To  : Method Type: To	Dil Fa Sampl otal/Na
Method: 325.2 - Chloride  Lab Sample ID: MB 680-303120/47  Matrix: Water Analysis Batch: 303120  Analyte Chloride  Lab Sample ID: LCS 680-303120/6  Matrix: Water Analysis Batch: 303120  Analyte Chloride  Method: 353.2 - Nitrogen, Nitrate  Lab Sample ID: MB 680-302253/13  Matrix: Water Analysis Batch: 302253	Result 1.0	Qualifier U	Spike Added 50.0	1.0	LCS Resuit	LCS Qua	mg/L	Unit	CI	Prilient D	Client S repared Sample %Rec 100	Analy 1713/1.  Analy 1713/1.  Box 1715  Analy 1713/1.  Analy 1715  Analy 1715  Analy 1715	: Method Type: To  yzed 3 15:15  Control S Type: To  : Method Type: To	Dil Fa Sampl otal/Na
Tethod: 325.2 - Chloride  Lab Sample ID: MB 680-303120/47  Matrix: Water Analysis Batch: 303120  Analyte Chloride  Lab Sample ID: LCS 680-303120/6  Matrix: Water Analysis Batch: 303120  Analyte Chloride  Tethod: 353.2 - Nitrogen, Nitrate  Lab Sample ID: MB 680-302253/13  Matrix: Water Analysis Batch: 302253  Analyte Nitrate as N  Lab Sample ID: LCS 680-302253/14	Result 1.0 -Nitrite MB Result	Qualifier U	Spike Added 50.0	1.0	LCS Resuit	LCS Qua	mg/L liffer Unit	Unit	Ci	Prilient D	Client S repared Sample %Rec 100 Client S	Analy Analy	: Method Type: To yzed 3 15:15 Control S Type: To : Method Type: To yzed 3 17:22 Control S	Dit Fa
Method: 325.2 - Chloride  Lab Sample ID: MB 680-303120/47  Matrix: Water Analysis Batch: 303120  Analyte Chloride  Lab Sample ID: LCS 680-303120/6  Matrix: Water Analysis Batch: 303120  Analyte Chloride  Method: 353.2 - Nitrogen, Nitrate  Lab Sample ID: MB 680-302253/13  Matrix: Water Analysis Batch: 302253  Analyte Nitrate as N  Lab Sample ID: LCS 680-302253/14  Matrix: Water	Result 1.0 -Nitrite MB Result	Qualifier U	Spike Added 50.0	1.0	LCS Resuit	LCS Qua	mg/L liffer Unit	Unit	Ci	Prilient D	Client S repared Sample %Rec 100 Client S	Analy Analy	: Method Type: To yzed 3 15:15 Control S Type: To : Method Type: To yzed 3 17:22	Dil Fa Sampl otal/N d Blan otal/N
Method: 325.2 - Chloride  Lab Sample ID: MB 680-303120/47  Matrix: Water Analysis Batch: 303120  Analyte Chloride  Lab Sample ID: LCS 680-303120/6  Matrix: Water Analysis Batch: 303120  Analyte Chloride  Method: 353.2 - Nitrogen, Nitrate  Lab Sample ID: MB 680-302253/13  Matrix: Water Analysis Batch: 302253  Analyte Nitrate as N  Lab Sample ID: LCS 680-302253/14  Matrix: Water	Result 1.0 -Nitrite MB Result	Qualifier U	Spike Added 50.0	1.0	LCS Result 50.0	LCS	mg/L dnit mg/L	Unit	Ci	Prilient D	Client S repared Sample %Rec 100 Client S	Analy ID Prep  Analy I1/13/1 e ID: Lab ( Prep  Rec. Limits 85 - 115  Sample ID Prep  Anal  11/07/1 e ID: Lab ( Prep	: Method Type: To yzed 3 15:15 Control S Type: To : Method Type: To yzed 3 17:22 Control S	Dit Fa
Method: 325.2 - Chloride  Lab Sample ID: MB 680-303120/47  Matrix: Water Analysis Batch: 303120  Analyte Chloride  Lab Sample ID: LCS 680-303120/6  Matrix: Water Analysis Batch: 303120  Analyte Chloride  Method: 353.2 - Nitrogen, Nitrate  Lab Sample ID: MB 680-302253/13  Matrix: Water Analysis Batch: 302253  Analyte Nitrate as N  Lab Sample ID: LCS 680-302253/14  Matrix: Water Analysis Batch: 302253	Result 1.0 -Nitrite MB Result	Qualifier U	Spike Added 50.0	1.0	LCS Result 50.0	LCS Qua	mg/L dnit mg/L	Unit mg/L	Ci	Pilient	Client S repared %Rec 100 Client S repared	Analy 17/13/1 e ID: Lab ( Prep  %Rec. Limits 85 - 115  Sample ID Prep  Anal 11/07/1 e ID: Lab ( Prep	: Method Type: To yzed 3 15:15 Control S Type: To : Method Type: To yzed 3 17:22 Control S	Dil Fa Sampl otal/N d Blan otal/N
Method: 325.2 - Chloride  Lab Sample ID: MB 680-303120/47  Matrix: Water Analysis Batch: 303120  Analyte Chloride  Lab Sample ID: LCS 680-303120/6  Matrix: Water Analysis Batch: 303120  Analyte Chloride  Method: 353.2 - Nitrogen, Nitrate  Lab Sample ID: MB 680-302253/13  Matrix: Water Analysis Batch: 302253  Analyte Nitrate as N  Lab Sample ID: LCS 680-302253/14  Matrix: Water Analysis Batch: 302253  Analyte  Natrix: Water Analysis Batch: 302253	Result 1.0 -Nitrite MB Result	Qualifier U	Spike Added 50.0	1.0	LCS Result 50.0	LCS Qua	mg/L dnit mg/L	Unit mg/L	Ci	Prilient D	Client S repared  %Rec 100  Client S repared	Analy 11/13/1 e ID: Lab ( Prep  %Rec. Limits 85 - 115  Sample ID Prep  Anal  11/07/1 e ID: Lab ( Prep  Anal Limits  %Rec. Limits	: Method Type: To yzed 3 15:15 Control S Type: To : Method Type: To yzed 3 17:22 Control S	Dil Fa Sampl otal/No
Method: 325.2 - Chloride  Lab Sample ID: MB 680-303120/47  Matrix: Water Analysis Batch: 303120  Analyte Chloride  Lab Sample ID: LCS 680-303120/6  Matrix: Water Analysis Batch: 303120  Analyte Chloride  Method: 353.2 - Nitrogen, Nitrate  Lab Sample ID: MB 680-302253/13  Matrix: Water Analysis Batch: 302253  Analyte Nitrate as N  Lab Sample ID: LCS 680-302253/14  Matrix: Water Analysis Batch: 302253	Result 1.0 -Nitrite MB Result	Qualifier U	Spike Added 50.0	1.0	LCS Result 50.0	MDL LCS	mg/L dnit mg/L	Unit mg/L	Ci	Pilient	Client S repared %Rec 100 Client S repared	Analy 17/13/1 e ID: Lab ( Prep  %Rec. Limits 85 - 115  Sample ID Prep  Anal 11/07/1 e ID: Lab ( Prep	: Method Type: To yzed 3 15:15 Control S Type: To : Method Type: To yzed 3 17:22 Control S	Dil Fa Sampl otal/N/

Spike

Added

0.500

Spike

Added

0.497

0.997

0.500

Spike

Added

0.497

0.997

0.500

Sample Sample

Sample Sample

0.050 U

0.050

0,050

Result Qualifier

0.050

0.050

0.050

Result Qualifier

LCS LCS

MS MS

MSD MSD

0.508

1.02

0,511

Result Qualifier

0.510

1.02

0.512

Result Qualifier

Qualifier

Unit

mg/L

Unit

mg/L

mg/L

mg/L

Unit

mg/L

mg/L

mg/L

Result

0,504

Method: 353.2 - Nitrogen, Nitrate-Nitrite (Continued)
Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013
Client: Solutia Inc.

Lab Sample ID: LCS 680-302253/14

Lab Sample ID: 680-95908-1 MS

Lab Sample ID: 680-95908-1 MSD

Matrix: Water

Analyte

Analyte

Nitrate as N

Nitrite as N

Analyte

Nitrate as N

Nitrite as N

Nitrate Nitrite as N

Nitrate Nitrite as N

Matrix: Water

Nitrite as N

Matrix: Water

Analysis Batch: 302253

Analysis Batch: 302253

TestAmerica Job ID: 680-95908-1

Client Sample ID: Lab Control Sample

%Rec.

Limits

90 - 110

%Rec.

Limits

90 - 110

90 - 110

90 - 110

%Rec.

Limits

90 - 110

90.110

90 - 110

Client Sample ID: BSA-MW-2D-1113

Client Sample ID: BSA-MW-2D-1113

%Rec

%Rec

103

103

102

%Rec

102

102

102

Ð

101

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

RPD

õ

0

SDG: KPS099

1



















RPD

Limit

10

10

10

















Analysis Batch: 302253

***************************************	Lab Sample ID: MB 680-302385/44 Matrix: Water							Client Sar	mple ID: Metho	
	Analysis Batch: 302385	MB	MB							
	Analyte Sulfate	Result 5,0	Qualifier U	RL. 5.0	MDL	Unit mg/L	D	Prepared	Analyzed 11/08/13 13:09	Dil Fac

Lab Sample ID: LCS 680-302385/35 Matrix: Water								ontrol Sample Type: Total/NA
Analysis Batch: 302385								
	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Sulfate	20,0	20.1		mg/L		100	75 - 125	

Analysis Batch: 302385								
	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Sulfate	20,0	20.1	t-12A-CARONANI	mg/L		100	75 - 125	 

Method: 415.1 - DOC									
Lab Sample ID: MB 680-303261/6							Client Sa	ample ID: Metho	d Blank
Matrix: Water								Prep Type: Di	ssolved
Analysis Batch: 303261									
-	мв	мв							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	1.0	U	1.0		mg/L	<i></i>		11/13/13 14:43	1

Method: 415.1 - DOC (Continued)
Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013
Client: Solutia Inc.

TestAmerica Job ID: 680-95908-1 SDG: KPS099

Client Sample ID: Lab Control Sample

Prep Type: Dissolved

Dil Fac

Analysis Batch: 303261 Spike LCS LCS %Rec. Analyte Added Result Qualifier Unit %Rec Limits Dissolved Organic Carbon 20.0 17.3 mg/L 86 80 - 120

Method: 415.1 - TOC

Analysis Batch: 303829

Analysis Batch: 303829

Matrix: Water

Matrix: Water

Lab Sample ID: LCS 680-303261/5

Lab Sample ID: MB 680-303829/26 Matrix: Water

Client Sample ID: Method Blank

Analyzed

Prep Type: Total/NA

MB MB Analyte Result Qualifier MDL Unit Prepared Total Organic Carbon 1.0 Ū 1.0 mg/L

11/16/13 17:13

Lab Sample ID: LCS 680-303829/29 Client Sample ID: Lab Control Sample Matrix: Water

Prep Type: Total/NA

Spike LCS LCS %Rec. Analyte Added Result Qualifier Limits Unit D %Rec

Total Organic Carbon 20.0 20.8 mg/L 104 80 - 120 Lab Sample ID: 680-95908-1 DU

Client Sample ID: BSA-MW-2D-1113 Prep Type: Total/NA

Analysis Batch: 303829 Sample Sample טם טם RPD Result Qualifier Result Qualifier Unit RPD Limit Total Organic Carbon 6.1 5.91 mg/L 25

## **QC Association Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

estAmerica	Jop	ID:	680-95908-1	
		S	DG: KPS099	

Analysis	Batch	: 302958
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	Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
	680-95908-3	CPA-MW-3D-1113	Total/NA	Water	8260B	Strict Control of the
	680-95908-5	BSA-MW-2D-EB	Total/NA	Water	8260B	
	680-95908-7	4Q13 LTM Trip Blank # 3	Total/NA	Water	8260B	
	LC\$ 680-302958/4	Lab Control Sample	Total/NA	Water	8260B	
	LCSD 680-302958/5	Lab Control Sample Dup	Total/NA	Water	8260B	
21142111	MB 680-302958/8	Method Blank	Total/NA	Water	8260B	

#### Analysis Batch: 303240

2	••••						8
	Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch	2000
	680-95908-1	BSA-MW-2D-1113	Total/NA	Water	8260B		200000
Company of	LCS 680-303240/4	Lab Control Sample	Total/NA	Water	8260B		200
	LCSD 680-303240/12	Lab Control Sample Dup	Total/NA	Water	8260B		177.53
4 -1 -1	MB 680-303240/8	Method Blank	Total/NA	Water	8260B		. 200
,	• **						100

## Analysis Batch: 303411

	Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
	680-95908-6	CPA-MW-3D-1113-AD	Total/NA	Water	8260B	
	LCS 680-303411/4	Lab Control Sample	Total/NA	Water	8260B	
	LCSD 680-303411/5	Lab Control Sample Dup	Total/NA	Water	8260B	
	MB 680-303411/9	Method Blank	Total/NA	Water	8260B	
,						

## GC VOA

## Analysis Batch: 302484

Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method Prep Batch
680-95908-1	BSA-MW-2D-1113	Total/NA	Water	RSK-175
LCS 680-302484/6	Lab Control Sample	Total/NA	Water	RSK-175
LCS 680-302484/7	Lab Control Sample	Total/NA	Water	RSK-175
LCSD 680-302484/8	Lab Control Sample Dup	Total/NA	Water	RSK-175
LCSD 680-302484/9	Lab Control Sample Dup	Total/NA	Water	RSK-175
MB 680-302484/4	Method Blank	Total/NA	Water	RSK-175

#### Analysis Batch: 302485

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-95908-3	CPA-MW-3D-1113	Total/NA	Water	RSK-175	
LCS 680-302485/4	Lab Control Sample	Total/NA	Water	RSK-175	
LCS 680-302485/6	Lab Control Sample	Total/NA	Water	RSK-175	
LCSD 680-302485/5	Lab Control Sample Dup	Total/NA	Water	RSK-175	
LCSD 680-302485/7	Lab Control Sample Dup	Total/NA	Water	RSK-175	
MB 680-302485/3	Method Blank	Total/NA	Water	RSK-175	

## Metals

## Prep Batch: 302362

Sandarda andreas	Lab Sample ID 680-95908-1	Client Sample ID BSA-MW-2D-1113	Prep Type Total Recoverable	Matrix Water	Method 3005A	Prep Batch
***************************************	680-95908-2	BSA-MW-2D-F(0.2)-1113	Dissolved	Water	3005A	
and the second	680-95908-3 680-95908-4	CPA-MW-3D-1113 CPA-MW-3D-F(0.2)-1113	Total Recoverable Dissolved	Water Water	3005A 3005A	
of the second	LCS 680-302362/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

## **QC Association Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95908-1

SDG: KPS099

Prep Batch: 302362 (C	ontinued)				
Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
MB 680-302362/1-A	Method Blank	Total Recoverable	Water	3005A	
nalysis Batch: 30275	0				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-95908-1	BSA-MW-2D-1113	Total Recoverable	Water	6010C	30236
680-95908-2	BSA-MW-2D-F(0,2)-1113	Dissolved	Water	6010C	30236
680-95908-3	CPA-MW-3D-1113	Total Recoverable	Water	6010C	30236
680-95908-4	CPA-MW-3D-F(0.2)-1113	Dissolved	Water	6010C	30236
LCS 680-302362/2-A	Lab Control Sample	Total Recoverable	Water	6010C	30236
MB 680-302362/1-A	Method Blank	Total Recoverable	Water	6010C	30236
Seneral Chemistry					
nalysis Batch: 30225	3				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batc
680-95908-1	BSA-MW-2D-1113	Total/NA	Water	353.2	
680-95908-1 MS	BSA-MW-2D-1113	Total/NA	Water	353,2	
680-95908-1 MSD	BSA-MW-2D-1113	Total/NA	Water	353.2	
680-95908-3	CPA-MW-3D-1113	Total/NA	Water	353.2	
LCS 680-302253/14	Lab Control Sample	Total/NA	Water	353.2	
MB 680-302253/13	Method Blank	Total/NA	Water	353.2	
nalysis Batch: 30238	5	,		·	
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Bato
680-95908-1	BSA-MW-2D-1113	Total/NA	Water	375,4	
680-95908-3	CPA-MW-3D-1113	Total/NA	Water	375.4	
LCS 680-302385/35	Lab Control Sample	Total/NA	Water	375.4	
MB 680-302385/44	Method Blank	Total/NA	Water	375.4	
nalysis Batch: 30312	0				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batc
680-95908-1	BSA-MW-2D-1113	Total/NA	Water	325,2	
680-95908-3	CPA-MW-3D-1113	Total/NA	Water	325.2	
LCS 680-303120/6	Lab Control Sample	Total/NA	Water	325.2	
MB 680-303120/47	Method Blank	Total/NA	Water	325.2	
nalysis Batch: 30326	1		•		
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Bato
680-95908-2	BSA-MW-2D-F(0,2)-1113	Dissolved	Water	415.1	
680-95908-4	CPA-MW-3D-F(0,2)-1113	Dissolved	Water	415.1	
LCS 680-303261/5	Lab Control Sample	Dissolved	Water	415.1	
MB 680-303261/6	Method Blank	Dissolved	Water	415.1	
nalysis Batch: 30338	0				
Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Bato
680-95908-1	BSA-MW-2D-1113	Total/NA	Water	310.1	
680-95908-3	CPA-MW-3D-1113	Total/NA	Water	310.1	
LCS 680-303380/6	Lab Control Sample	Total/NA	Water	310.1	
LCSD 680-303380/32	Lab Control Sample Dup	Total/NA	Water	310.1	
MB 680-303380/5	Method Blank	Total/NA	Water	310.1	

## **QC Association Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95908-1 SDG: KPS099

## General Chemistry (Continued)

Analysis Batch: 303829

	ер Туре	Matrix	Method	Prep Batch
680-95908-1 BSA-MW-2D-1113 Total	tal/NA	Water	415.1	
680-95908-1 DU BSA-MW-2D-1113 Tota	tal/NA	Water	415.1	
680-95908-3 CPA-MW-3D-1113 Total	tal/NA	Water	415.1	
LCS 680-303829/29 Lab Control Sample Total	tal/NA	Water	415.1	
MB 680-303829/26 Method Blank Total	tal/NA	Water	415.1	

TestAmerica Savannah

#### Lab Chronicle

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95908-1

SDG: KPS099

Client Sample ID: BSA-MW-2D-1113

Date Collected: 11/06/13 11:55 Date Received: 11/07/13 10:01 Lab Sample ID: 680-95908-1

Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		2000	303240	11/14/13 18:44	JD1	TAL SAV
Total/NA	Analysis	RSK-175		1	302484	11/10/13 16:54	AJMC	TAL SAV
Total Recoverable	Prep	3005A			302362	11/08/13 11:32	BJB	TAL SAV
Total Recoverable	Analysis	6010C		1	302750	11/11/13 23:57	BCB	TAL SAV
Total/NA	Analysis	353,2		1	302253	11/07/13 17:24	CRW	TAL SAV
Total/NA	Analysis	375.4		1	302385	11/08/13 11:32	JME	TAL SAV
Total/NA	Analysis	325.2		2	303120	11/13/13 15:02	JME	TAL SAV
Total/NA	Analysis	310.1		1	303380	11/14/13 17:51	LBH	TAL SAV
Total/NA	Analysis	415.1		1	303829	11/16/13 20:25	CMP	TAL SAV

Client Sample ID: BSA-MW-2D-F(0.2)-1113

Date Collected: 11/06/13 11:55

Date Received: 11/07/13 10:01

Lab Sample ID: 680-95908-2

Matrix: Water

-		Batch	Batch		Dilution	Batch	Prepared		
	Ргер Туре	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
-	Dissolved	Prep	3005A	MANAGEMENT CARROWS		302362	11/08/13 11:32	BJB	TAL SAV
-	Dissolved .	Analysis	6010C ,		1	302750	11/12/13 00:01	BCB	TAL SAV
	Dissolved	Analysis	415.1		1	303261	11/13/13 18:45	CMP	TAL SAV

Client Sample ID: CPA-MW-3D-1113

Date Collected: 11/06/13 14:20

Date Received: 11/07/13 10:01

Lab Sample ID: 680-95908-3

Matrix: Water

Batch	Batch		Dilution	Batch	Prepared		
Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Analysis	8260B		100	302958	11/13/13 20:40	JD1	TAL SAV
Analysis	RSK-175		1	302485	11/11/13 12:27	TF1	TAL SAV
Prep	3005A			302362	11/08/13 11:32	вЈв	TAL SAV
Analysis	6010C		1	302750	11/12/13 00:06	BCB	TAL SAV
Analysis	353.2		1	302253	11/07/13 17:30	CRW	TAL SAV
Analysis	375.4		1	302385	11/08/13 11:32	JME	TAL SAV
Analysis	325.2		5	303120	11/13/13 14:53	JME	TAL SAV
Analysis	310.1		1	303380	11/14/13 18:01	LBH	TAL SAV
Analysis	415.1		1	303829	11/16/13 20:50	CMP	TAL SAV
	Type Analysis Analysis Prep Analysis Analysis Analysis Analysis Analysis	Type Method Analysis 8260B Analysis RSK-175 Prep 3005A Analysis 6010C Analysis 353.2 Analysis 375.4 Analysis 325.2 Analysis 325.2 Analysis 310.1	Type         Method         Run           Analysis         8260B           Analysis         RSK-175           Prep         3005A           Analysis         6010C           Analysis         353.2           Analysis         375.4           Analysis         325.2           Analysis         310.1	Type         Method         Run         Factor           Analysis         8260B         100           Analysis         RSK-175         1           Prep         3005A         3005A           Analysis         6010C         1           Analysis         353.2         1           Analysis         375.4         1           Analysis         325.2         5           Analysis         310.1         1	Type         Method         Run         Factor         Number           Analysis         8260B         100         302958           Analysis         RSK-175         1         302485           Prep         3005A         302362           Analysis         6010C         1         302750           Analysis         353.2         1         302263           Analysis         375.4         1         302385           Analysis         325.2         5         303120           Analysis         310.1         1         303380	Type         Method         Run         Factor         Number         or Analyzed           Analysis         8260B         100         302958         11/13/13 20:40           Analysis         RSK-175         1         302485         11/11/13 12:27           Prep         3005A         302362         11/08/13 11:32           Analysis         6010C         1         302750         11/12/13 00:06           Analysis         353.2         1         302253         11/07/13 17:30           Analysis         375.4         1         302385         11/08/13 11:32           Analysis         325.2         5         303120         11/13/13 14:53           Analysis         310.1         1         303380         11/14/13 18:01	Type         Method         Run         Factor         Number         or Analyzed         Analyst           Analysis         8260B         100         302958         11/13/13 20:40         JD1           Analysis         RSK-175         1         302485         11/11/13 12:27         TF1           Prep         3005A         302362         11/08/13 11:32         BJB           Analysis         6010C         1         302750         11/12/13 00:06         BCB           Analysis         353.2         1         302253         11/07/13 17:30         CRW           Analysis         375.4         1         302385         11/08/13 11:32         JME           Analysis         325.2         5         303120         11/13/13 14:53         JME           Analysis         310.1         1         303380         11/14/13 18:01         LBH

Client Sample ID: CPA-MW-3D-F(0.2)-1113

Date Collected: 11/06/13 14:20 Date Received: 11/07/13 10:01 Lab Sample ID: 680-95908-4

Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	3005A		***************************************	302362	11/08/13 11:32	BJB	TAL SAV
Dissolved	Analysis	6010C		1	302750	11/12/13 00:20	BCB	TAL SAV

TestAmerica Savannah

DEC 0 6 2013/M

#### Lab Chronicle

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95908-1

SDG: KPS099

Client Sample ID: CPA-MW-3D-F(0.2)-1113

Date Collected: 11/06/13 14:20 Date Received: 11/07/13 10:01 Lab Sample ID: 680-95908-4

Matrix: Water

Batch Batch Dilution Batch Prepared Prep Type Type Method Run Factor Number or Analyzed Analyst Lab CMP TAL SAV Dissolved Analysis 415.1 303261 11/13/13 18:59

Client Sample ID: BSA-MW-2D-EB

Lab Sample ID: 680-95908-5

Matrix: Water

Date Collected: 11/06/13 10:45 Date Received: 11/07/13 10:01

Batch Batch Dilution Batch Prepared Method or Analyzed Prep Type Type Run Factor Number Analyst Lab 8260B 302958 11/13/13 15:05 JD1 TAL SAV Total/NA Analysis

Client Sample ID: CPA-MW-3D-1113-AD

Lab Sample ID: 680-95908-6

Date Collected: 11/06/13 14:20 Date Received: 11/07/13 10:01

Matrix: Water

Batch Batch Dilution Batch Prepared Prep Type Туре Method Factor Number or Analyzed Analyst Lab TAL SAV Total/NA Analysis 8260B 50 303411 11/15/13 19:48 JD1

Client Sample ID: 4Q13 LTM Trip Blank #3

Lab Sample ID: 680-95908-7

Matrix: Water

Date Collected: 11/06/13 00:00 Date Received: 11/07/13 10:01

Batch Batch Dilution Batch Prepared Prep Type Туре Method Factor or Analyzed Analyst Lab Run Number 8260B 302958 11/13/13 14:36 JD1 TAL SAV Total/NA Analysis

Laboratory References:

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

TestAmerica Savannah

DEC 9 6 2013

680-95708

Savannah 5102 LaRoche Avenue		Chain of	Chain of Custody Record	' Record		TestAmerica
Savannah, GA 31404 phone 912.354,7858 fax 912.352.0165						TestAmerica Laboratories, Inc.
tact	Project Manager: Bob Billman		Site Contact: Michael Corbett	sael Corbett	11/1/10/11/5	COC No:
	Tel/Fax: (314) 743-4108		Lab Contact: Michele Kersey		ÌΤ	of COCs
1001 Highlands Piaza Drive West, Suite 300	Analysis Turnaround Time	d Time				Job No.
St. Louis, MO 63110	Calendar (C) or Work Days (W)	<b>∂</b>	†'\$ <i>!</i>			
(314) 429-0100 Phone	TAT if different from Bolow Standard	Standard	. S & G	SI		
(314) 429-0462 FAX	2 weeks			. I N		SDG No.
Project Name: 4Q13 LTM GW Sampling	1 week			SH A		
Site: Solutia WG Krummrich Facility	2 days	01	10'1 1à eo	(d ro L.		
PO#	1 day	duite	6 24 8260	1.21 1.2.1 1.2.1		
Sample Identification	Sample Sample Sample Date Time Type	Matrix Coel (7)	VOCs by 1 Total Perk Alle/CO2 I	Dissolved TOC by 4 Dissolved		Sample Specific Notes:
	0 5511 810/11	Water 12	3 1 1 1	3 2 1		
BSA-MW-2D-F(0.2)-1113	o  991.1	Water 2 X		1 1		
CPA-MW-3D-1113	0 108H1 1	Water 12	3 1 1 1	3 2 1		
CPA-MW-3D-F(0.2)-1113	430 c	Water 2 X		I		
88. 444.45 W. 414.65	ა	Water 12	3 1 1 1	3 2 1		
SHE	9	Water 2 X		1 1		
1854-MW-40-#B	s (SHQ)	Water 3	3			
CPA-MW-3D-1113-AD	。  98h  个	Water 3	3			
	5	Water 12	3 1 1	3-2-4-	680-95908 Chain of Custody	ain of Custody
	U	Water 2 X		1 1		
4Q13 LTM Trip Blank # 3	11/0/13	Water 2	2			
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6=	H; 6= Other	,	2 4 1 1	1 3,1 2 4 2		
Possible Hazard Identification	Fison R		Sample Dispo	ile Disposal ( A fee may be ass Return To Client ■ Disp	Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)  ———————————————————————————————————	e retained longer than 1 month)  Richive For
Is/QC Requirements & Co			1			
				7		
Reingling by: [L. / ALS	Company: URS	Dato/Time:	Received Dis		Company:	Date/Time: [0:0]
Relinquished by:	Company:	Date/Time:	Received by:		Company:	Dato-Yime/
Relinquished by:	Company:	Date/Time:	Received by:		Company:	Date/Time:

## Login Sample Receipt Checklist

Client: Solutia Inc.

Job Number: 680-95908-1

SDG Number: KPS099

List Source: TestAmerica Savannah

Login Number: 95908 List Number: 1

Creator: Contreras, Cesar A

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or ampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
s the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	•
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	False	Samples 1(B,D), 2(A,B), 3B, 4(A,B) have pH greater than 2
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is 6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



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## **Certification Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95908-1

SDG: KPS099

#### Laboratory: TestAmerica Savannah

All certifications held by this laboratory are fisted. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
	AFCEE		SAVLAB	
A2LA	DoD ELAP		399.01	02-28-15
A2LA	ISO/IEC 17025		399.01	02-28-15
Alabama	State Program	4	41450	06-30-14
Arkansas DEQ	State Program	6	88-0692	02-01-14
California	NELAP	9	3217CA	07-31-14
Colorado	State Program	8	N/A	12-31-13 *
Connecticut	State Program	1	PH-0161	03-31-15
Florida	NELAP	4	E87052	06-30-14
GA Dept. of Agriculture	State Program	4	N/A	12-31-13 *
Georgia	State Program	4	N/A	06-30-14
Georgia	State Program	4	803	06-30-14
Guam	State Program	9	09-005r	06-17-14
Hawaii	State Program	9	N/A	06-30-14
Illinois	NELAP	5	200022	11-30-13 *
ndiana	State Program	5	N/A	06-30-14
lowa	State Program	7	353	07-01-15
Kentucky	State Program	4	90084	12-31-13 *
Kentucky (UST)	State Program	4	18	06-30-14
Louisiana	NELAP	6	30690	06-30-14
Maine	State Program	1	GA00006	08-16-14
Maryland	State Program	3	250	12-31-13 *
Massachusetts	` State Program	` 1	M-GA006 '	06-30-14
Michigan	State Program	5	9925	06-30-14
Mississippi	State Program	4	N/A	06-30-14
Montana	State Program	8	CERT0081	01-01-14 *
Nebraska	State Program	7	TestAmerica-Savannah	06-30-14
New Jersey	NELAP	2	GA769	06-30-14
New Mexico	State Program	6	N/A	06-30-14
New York	NELAP	2	10842	04-01-14
North Carolina DENR	State Program	4	269	12-31-13 *
North Carolina DHHS	State Program	4	13701	07-31-14
Oklahoma	State Program	6	9984	08-31-14
Pennsylvania	NELAP	3	68-00474	06-30-14
Puerto Rico	State Program	2	GA00006	01-01-14 *
South Carolina	State Program	4	98001	06-30-14
Tennessee	State Program	4	TN02961	06-30-14
Texas	NELAP	6	T104704185-08-TX	11-30-14
JSDA	Federal	-	SAV 3-04	04-07-14
/irginia	NELAP	3	460161	06-14-14
Vashington	State Program	10	C1794	06-10-14
Vest Virginia	State Program	3	9950C	12-31-13 *
West Virginia DEP	State Program	3	94	06-30-14
West Virginia DEP Wisconsin	•	5	999819810	08-31-14
Wyoming	State Program State Program	8	8TMS-L	06-30-14

<sup>\*</sup> Expired certification is currently pending renewal and is considered valid.

# Solutia Krummrich Data Review WGK LTM 4Q13

**Laboratory SDG: KPS100** 

Data Reviewer: Melissa Mansker Peer Reviewer: Elizabeth Kunkel

**Date Reviewed: 12/9/2013** 

Guidance: USEPA National Functional Guidelines for Superfund Organic Methods Data Review 2008. USEPA National Functional Guidelines for Superfund

**Inorganic Data Review 2010** 

Work Plan: Revised Long-Term Monitoring Program (LTMP) Work Plan (Solutia

2009)

Sample Identification			
GWE-5S-1113	GWE-5S-F(0.2)-1113		
GWE-5M-1113	GWE-5M-F(0.2)-1113		
GWE-5D-1113	GWE-5D-F(0.2)-1113		
GWE-3D-1113	GWE-3D-F(0.2)-1113		
4Q13 LTM Trip Blank #4			

#### 1.0 Data Package Completeness

Were all items delivered as specified in the QAPP and COC as appropriate?

Yes

#### 2.0 Laboratory Case Narrative \ Cooler Receipt Form

Were problems noted in the laboratory case narrative or cooler receipt form?

Yes, the laboratory case narrative indicated samples were diluted due to high levels of target analytes. This issue is addressed further in the appropriate section below.

The cooler receipt form indicated that one of one coolers was received by the laboratory at a temperature of 1.4°C, which is outside the 4°C ± 2°C criteria. The samples were received in good condition; therefore no qualification of data was required.

#### 3.0 Holding Times

Were samples extracted/analyzed within applicable limits?

Yes

#### 4.0 Blank Contamination

Were any analytes detected in the Method Blanks, Field Blanks or Trip Blanks?

No

## 5.0 Laboratory Control Sample

Were LCS recoveries within evaluation criteria?

Yes

## 6.0 Surrogate Recoveries

Were surrogate recoveries within evaluation criteria?

Yes

## 7.0 Matrix Spike and Matrix Spike Duplicate Recoveries

Were MS/MSD samples collected as part of this SDG?

Yes, although not requested, sample GWE-5S-1113 was analyzed for metals.

Were MS/MSD recoveries within evaluation criteria?

Yes

## 8.0 Internal Standard (IS) Recoveries

Were internal standard area recoveries within evaluation criteria?

Yes

## 9.0 Laboratory Duplicate Results

Were laboratory duplicate samples collected as part of this SDG?

Yes, sample GWE-5D-1113 was duplicated and analyzed for alkalinity.

Were laboratory duplicate sample RPDs within criteria?

Yes

## 10.0 Field Duplicate Results

Were field duplicate samples collected as part of this SDG?

No

#### 10.0 Sample Dilutions

For samples that were diluted and nondetect, were undiluted results also reported? Not applicable; analytes were detected in samples that were diluted.

## 11.0 Additional Qualifications

Were additional qualifications applied?

No

### SDG KPS100

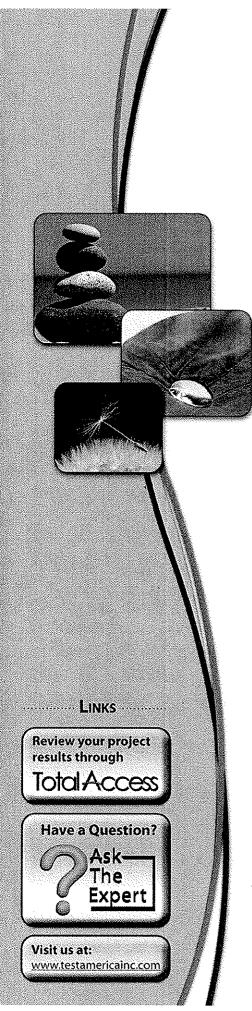
Results of Samples from Monitoring Well:

**GWE-5S** 

**GWE-5M** 

GWE-5D

GWE-3D



# **TestAmerica**

THE LEADER IN ENVIRONMENTAL TESTING

### **ANALYTICAL REPORT**

TestAmerica Laboratories, Inc. TestAmerica Savannah 5102 LaRoche Avenue Savannah, GA 31404 Tel: (912)354-7858

TestAmerica Job ID: 680-95983-1 TestAmerica Sample Delivery Group: KPS100

Client Project/Site: WGK Long Term Monitoring - 4Q13 NOV

2013

For: Solutia Inc. 575 Maryville Centre Dr. Saint Louis, Missouri 63141

Attn: Mr. Jerry Rinaldi

Michele RKusy

Authorized for release by: 11/26/2013 2:53:43 PM

Michele Kersey, Project Manager I (912)354-7858 michele.kersey@testamericainc.com

Reviewed on

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95983-1

SDG: KPS100

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#### **Case Narrative**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95983-1

SDG: KPS100

Job ID: 680-95983-1

Laboratory: TestAmerica Savannah

Narrative

#### CASE NARRATIVE

Client: Solutia Inc.

Project: WGK Long Term Monitoring - 4Q13 NOV 2013

Report Number: 680-95983-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

#### RECEIPT

The samples were received on 11/8/2013 10:01 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.4° C.

#### **VOLATILE ORGANIC COMPOUNDS (GC-MS)**

Samples GWE-5S-1113 (680-95983-1), GWE-5M-1113 (680-95983-3), GWE-5D-1113 (680-95983-5), GWE-3D-1113 (680-95983-7) and 4Q13 LTM Trip Blank #4 (680-95983-9) were analyzed for Volatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 11/20/2013.

Samples GWE-5D-1113 (680-95983-5)[2X] and GWE-3D-1113 (680-95983-7)[25X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the volatiles analysis.

All quality control parameters were within the acceptance limits.

#### **DISSOLVED GASES**

Samples GWE-5S-1113 (680-95983-1), GWE-5M-1113 (680-95983-3), GWE-5D-1113 (680-95983-5) and GWE-3D-1113 (680-95983-7) were analyzed for dissolved gases in accordance with RSK-175. The samples were analyzed on 11/11/2013.

No difficulties were encountered during the dissolved gases analysis.

All quality control parameters were within the acceptance limits.

#### METALS (ICP)

Samples GWE-5S-F(0.2)-1113 (680-95983-2), GWE-5M-F(0.2)-1113 (680-95983-4), GWE-5D-F(0.2)-1113 (680-95983-6) and GWE-3D-F(0.2)-1113 (680-95983-8) were analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 11/11/2013 and analyzed on 11/12/2013 and 11/13/2013.

No difficulties were encountered during the metals analysis.

All quality control parameters were within the acceptance limits.

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#### **Case Narrative**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95983-1

SDG: KPS100

Job ID: 680-95983-1 (Continued)

Laboratory: TestAmerica Savannah (Continued)

#### METALS (ICP)

Samples GWE-5S-1113 (680-95983-1), GWE-5M-1113 (680-95983-3), GWE-5D-1113 (680-95983-5) and GWE-3D-1113 (680-95983-7) were analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 11/11/2013 and analyzed on 11/12/2013 and 11/13/2013.

No difficulties were encountered during the metals analysis.

All quality control parameters were within the acceptance limits.

#### **ALKALINITY**

Samples GWE-5S-1113 (680-95983-1), GWE-5M-1113 (680-95983-3), GWE-5D-1113 (680-95983-5) and GWE-3D-1113 (680-95983-7) were analyzed for alkalinity in accordance with EPA Method 310.1. The samples were analyzed on 11/18/2013.

No difficulties were encountered during the alkalinity analysis.

All quality control parameters were within the acceptance limits.

#### CHLORIDE

Samples GWE-5S-1113 (680-95983-1), GWE-5M-1113 (680-95983-3), GWE-5D-1113 (680-95983-5) and GWE-3D-1113 (680-95983-7) were analyzed for Chloride in accordance with EPA Method 325.2. The samples were analyzed on 11/13/2013.

Sample GWE-3D-1113 (680-95983-7)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the chloride analysis.

All quality control parameters were within the acceptance limits.

#### **NITRATE-NITRITE AS NITROGEN**

Samples GWE-5S-1113 (680-95983-1), GWE-5M-1113 (680-95983-3), GWE-5D-1113 (680-95983-5) and GWE-3D-1113 (680-95983-7) were analyzed for nitrate-nitrite as nitrogen in accordance with EPA Method 353.2. The samples were analyzed on 11/08/2013.

No difficulties were encountered during the nitrate-nitrite analysis.

All quality control parameters were within the acceptance limits.

#### SULFATE

Samples GWE-5S-1113 (680-95983-1), GWE-5M-1113 (680-95983-3), GWE-5D-1113 (680-95983-5) and GWE-3D-1113 (680-95983-7) were analyzed for sulfate in accordance with EPA Method 375.4. The samples were analyzed on 11/11/2013.

Samples GWE-5S-1113 (680-95983-1)[5X], GWE-5M-1113 (680-95983-3)[5X], GWE-5D-1113 (680-95983-5)[20X] and GWE-3D-1113 (680-95983-7)[20X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the sulfate analysis.

All quality control parameters were within the acceptance limits.

#### **TOTAL ORGANIC CARBON**

Samples GWE-5S-1113 (680-95983-1), GWE-5M-1113 (680-95983-3), GWE-5D-1113 (680-95983-5) and GWE-3D-1113 (680-95983-7) were analyzed for total organic carbon in accordance with EPA Method 415.1. The samples were analyzed on 11/16/2013.

No difficulties were encountered during the TOC analysis.

All quality control parameters were within the acceptance limits.

DEC 0 8 5013

TestAmerica Savannah

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#### **Case Narrative**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95983-1

SDG: KPS100

#### Job ID: 680-95983-1 (Continued)

Laboratory: TestAmerica Savannah (Continued)

#### DISSOLVED ORGANIC CARBON (DOC)

Samples GWE-5S-F(0.2)-1113 (680-95983-2), GWE-5M-F(0.2)-1113 (680-95983-4), GWE-5D-F(0.2)-1113 (680-95983-6) and GWE-3D-F(0.2)-1113 (680-95983-8) were analyzed for Dissolved Organic Carbon (DOC) in accordance with EPA Method 415.1. The samples were analyzed on 11/13/2013.

No difficulties were encountered during the DOC analysis.

All quality control parameters were within the acceptance limits.

### **Sample Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95983-1

SDG: KPS100

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-95983-1	GWE-5S-1113	Water	11/07/13 13:40	11/08/13 10:01
680-95983-2	GWE-5S-F(0.2)-1113	Water	11/07/13 13:40	11/08/13 10:01
680-95983-3	ر م GWE-5M-1113	Water	11/07/13 12:00	11/08/13 10:01
680-95983-4	GWE-5M-F(0.2)-1113	Water	11/07/13 12:00	11/08/13 10:01
680-95983-5	GWE-5D-1113	Water	11/07/13 10:45	11/08/13 10:01
680-95983-6	GWE-5D-F(0.2)-1113	Water	11/07/13 10:45	11/08/13 10:01
680-95983-7	GWE-3D-1113 🖍	Water	11/07/13 15:30	11/08/13 10:01
680-95983-8	GWE-3D-F(0.2)-1113	Water	11/07/13 15:30	11/08/13 10:01
680-95983-9	4Q13 LTM Trip Blank #4	Water	11/07/13 00:00	11/08/13 10:01

### **Method Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95983-1

SDG: KPS100

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SAV
RSK-175	Dissolved Gases (GC)	RSK	TAL SAV
6010C	Metals (ICP)	SW846	TAL SAV
310.1	Alkalinity	MCAVW	TAL SAV
325.2	Chloride	MCAWW	TAL SAV
353.2	Nitrogen, Nitrate-Nitrite	MCAWW	TAL SAV
375.4	Sulfate	MCAWW	TAL SAV
415.1	TOC	MCAWW	TAL SAV
415.1	DOC	MCAWW	TAL SAV

#### Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

RSK = Sample Prep And Calculations For Dissolved Gas Analysis In Water Samples Using A GC Headspace Equilibration Technique, RSKSOP-175,

Rev. 0, 8/11/94, USEPA Research Lab

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

DEC 0 9 2013

### **Definitions/Glossary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95983-1

SDG: KPS100

#### Qualifiers

#### GC/MS VOA

Qualifier Qualifier Description

U Indicates the analyte was analyzed for but not detected.

#### GC VOA

Qualifier Qualifier Description

U Indicates the analyte was analyzed for but not detected.

#### Metals

Qualifier Qualifier Description

U Indicates the analyte was analyzed for but not detected.

#### **General Chemistry**

Qualifier Qualifier Description

J indicates the analyte was analyzed for but not detected.

#### Glossary

Abbreviation These commonly used abbreviations may or may not be present in this report.

Listed under the "D" column to designate that the result is reported on a dry weight basis

%R Percent Recovery
CNF Contains no Free Liquid

DER Duplicate error ratio (normalized absolute difference)

Dil Fac Dilution Factor

DL, RA, RE, IN Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample

DLC' Decision level concentration

MDA Minimum detectable activity

EDL Estimated Detection Limit

MDC Minimum detectable concentration

MDL Method Detection Limit
ML Minimum Level (Dioxin)

NC Not Calculated

ND Not detected at the reporting limit (or MDL or EDL if shown)

PQL Practical Quantitation Limit
QC Quality Control

RER Relative error ratio

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin)
TEQ Toxicity Equivalent Quotient (Dioxin)

DEC 0 9 2013

### **Detection Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95983-1

Lab Sample ID: 680-95983-1

Lab Sample ID: 680-95983-2

Lab Sample ID: 680-95983-4

Lab Sample ID: 680-95983-5

SDG: KP\$100

Client	Sample	: ID:	GWE-8	5S-11	113

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Ргер Туре
Benzene	7.8		1.0		ug/L	1		8260B	Total/NA
Methane	1.2		0.58		ug/L	1		R\$K-175	Total/NA
Manganese	0.24		0.010		mg/L	1		6010C	Total
Chloride	34		1.0		mg/L	1		325.2	Recoverable Total/NA
Nitrate as N	0.37		0,050		mg/L	1		353.2	Tota!/NA
Sulfate	100		25		mg/L	5		375.4	Total/NA
Total Organic Carbon	4.2		1.0		mg/L	1		415.1	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Alkalinity	440	************************	5.0		mg/L	1		310.1	Total/NA
Carbon Dioxide, Free	49		5.0		mg/L	1		310.1	Total/NA

### Client Sample ID: GWE-5S-F(0.2)-1113

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Ргер Туре
Manganese, Dissolved	0.24		0.010		mg/L	1		6010C	Dissolved
Dissolved Organic Carbon	4.0		1.0		mg/L	1		415.1	Dissolved

### Client Sample ID: CIME EM 1112

Client Sample ID: GWE-5N	lient Sample ID: GWE-5M-1113									
Analyte	Result Q	ualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type	
Benzene	5.0		1.0	***************************************	ug/L	1	_	8260B	Total/NA	
, Methane	、 31	. (	.58		ug/L	, 1		RSK-175	Total/NA	
Iron	22	0.	050		mg/L	1		6010C	Total	
Manganese	1.2	0.	010		mg/L	1		6010C	Recoverable Total Recoverable	
Chloride	51		1.0		mg/L	1		325.2	Total/NA	
Sulfate	100		25		mg/L	5		375.4	Total/NA	
Total Organic Carbon	1.8		1.0		mg/L	1		415.1	Total/NA	
Analyte	Result Q	ualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type	
Alkalinity	430		5.0		mg/L	1		310.1	Total/NA	
Carbon Dioxide, Free	40		5.0		mg/L	1		310.1	Total/NA	

### Client Sample ID: GWE-5M-F(0.2)-1113

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Ргер Туре
Iron, Dissolved	23		0.050	-	mg/L	1		6010C	Dissolved
Manganese, Dissolved	1.2		0.010		mg/L	1		6010C	Dissolved
Dissolved Organic Carbon	1.7		1.0		mg/L	1		415.1	Dissolved

#### Client Sample ID: GWE-5D-1113

			·, ·, · ·, · · · · · · · · · · · · · ·						
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	9.6		2,0		ug/L	2		8260B	Total/NA
Chlorobenzene	160		2,0		ug/L	2		8260B	Total/NA
1,2-Dichlorobenzene	4.2		2,0		ug/L	2		8260B	Total/NA
1,4-Dichlorobenzene	18		2.0		ug/L	2		8260B	Total/NA
Methane	45		0.58		ug/L	1		RSK-175	Total/NA
Iron	16		0.050		mg/L	1		6010C	Total
									Recoverable

This Detection Summary does not include radiochemical test results.

### **Detection Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95983-1

SDG: KPS100

### Client Sample ID: GWE-5D-1113 (Continued)

Lal	b Sa	mple	ID:	680-9	5983-5

	Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Ргер Туре
3	Manganese	0.43		0,010	4.67.00.00.00.000	mg/L	1		6010C	Total
200	Chloride	94		1.0		mg/L	1		325.2	Recoverable Total/NA
	Sulfate	460		100		mg/L	20		375.4	Total/NA
	Total Organic Carbon	2.6		1.0		mg/L	1		415.1	Total/NA
	Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Ргер Туре
	Alkalinity	330	2.112/2014	5.0	The state of the s	mg/L	1		310.1	Total/NA
	Carbon Dioxide, Free	28		5.0		mg/L	1		310.1	Total/NA



### Client Sample ID: GWE-5D-F(0.2)-1113

#### Lab Sample ID: 680-95983-6

r									
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron, Dissolved	16	***************************************	0.050		mg/L	1	****	6010C	Dissolved
Manganese, Dissolved	0.42		0.010		mg/L	1		6010C	Dissolved
Dissolved Organic Carbon	2.5		1.0		mg/L	1		415.1	Dissolved



### Client Sample ID: GWE-3D-1113

### Lab Sample ID: 680-95983-7

Analyte	Result	Qualifier	RL.	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	36	Laurence de la constante de la	25	~~~~	ug/L	25		8260B	Total/NA
Chlorobenzene	1900		25		ug/L	25		8260B	Total/NA
1,2-Dichlorobenzene	25		25		ug/L	25		8260B	Total/NA
1,4-Dichlorobenzene	160		, 25		ug/L	, 25		8260B	Total/NA
Methane	35		0.58		ug/i_	1		RSK-175	Total/NA
Iron	26		0.050		mg/L	1		6010C	Total
									Recoverable
Manganese	0.74		0.010		mg/iL	1		6010C	Total
									Recoverable
Chloride	870		10		mg/L	10		325.2	Total/NA
Sulfate	410		100		mg/L	20		375.4	Total/NA
Total Organic Carbon	4.9		1.0		mg/L	1		415.1	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Alkalinity	390	,	5.0		mg/L	1	*****	310.1	Total/NA
Carbon Dioxide, Free	43		5.0		mg/L	1		310.1	Total/NA

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#### Client Sample ID: GWE-3D-F(0.2)-1113

#### Lab Sample ID: 680-95983-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
fron, Dissolved	26		0.050		mg/L	1		6010C	Dissolved
Manganese, Dissolved	0.76	C	0.010		mg/L	1		6010C	Dissolved
Dissolved Organic Carbon	4.8		1.0		mg/L	1		415.1	Dissolved

## Lab Sample ID: 680-95983-9

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample ID: 4Q13 LTM Trip Blank #4

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95983-1

SDG: KPS100

Client Sample ID: GWE-5S-1113

Date Collected: 11/07/13 13:40 Date Received: 11/08/13 10:01 Lab Sample ID: 680-95983-1

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	7.8		1.0		ug/L			11/20/13 03:06	1
Chlorobenzene	1.0	υ	1.0		ug/L			11/20/13 03:06	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			11/20/13 03:06	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			11/20/13 03:06	1
1,4-Dichlorobenzene	1.0	υ	1.0		ug/L			11/20/13 03:06	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	97	,-,	70 - 130					11/20/13 03:06	1
Dibromofluoromethane	109		70 - 130					11/20/13 03:06	7
Toluene-d8 (Surr)	100		70 - 130					11/20/13 03:06	1
Method: RSK-175 - Dissolve	ed Gases (GC)							,	
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	1.1	Ü	1.1		ug/L			11/11/13 11:35	1
Ethylene	1,0	U	1.0		ug/L			11/11/13 11:35	1
Methane	1.2		0.58		ug/L			11/11/13 11:35	1
Method: 6010C - Metals (ICI	P) - Total Recoverat	ole							
Analyte	Result	Qualifier	RL	MDI.	Unit	D	Prepared	Analyzed	Dil Fac
ron	0.050	Ū	0,050		mg/L		11/11/13 13:32	11/12/13 23:27	1
Manganese	0.24		0.010		mg/L		11/11/13 13:32	11/12/13 23:27	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	34		1.0		mg/L			11/13/13 14:15	1
Nitrate as N	0.37		0.050		mg/L			11/08/13 16:00	1
Sulfate	100		25		mg/L			11/11/13 16:27	5
Total Organic Carbon	4.2		1.0		mg/L			11/16/13 21:04	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	440		5.0		mg/L			11/18/13 12:33	1
Carbon Dioxide, Free	49		5.0		mg/L			11/18/13 12:33	•

TestAmerica Savannah

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95983-1

SDG: KPS100

Client Sample ID: GWE-5S-F(0.2)-1113

Date Collected: 11/07/13 13:40 Date Received: 11/08/13 10:01

Dissolved Organic Carbon

Lab Sample ID: 680-95983-2

11/13/13 19:15

Matrix: Water

Method: 6010C - Metals (ICP) -	Dissolved								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	0.050	U	0.050		mg/L		11/11/13 13:32	11/12/13 23:50	1
Manganese, Dissolved	0.24		0.010		mg/L		11/11/13 13:32	11/12/13 23:50	1
General Chemistry - Dissolved	i								
Analyte	Result	Qualifier	RL	MDL	Unit	Ð	Prepared	Analyzed	Dil Fac

1.0

4.0

mg/L

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring ~ 4Q13 NOV 2013

TestAmerica Job ID: 680-95983-1

SDG: KPS100

Client Sample ID: GWE-5M-1113

Date Collected: 11/07/13 12:00 Date Received: 11/08/13 10:01 Lab Sample ID: 680-95983-3

Matrix: Water

Method: 8260B - Volatile Or Analyte	•	(GC/MS) Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dit Fac
Benzene	5.0	Ganitei	1.0		ug/L		tepared	11/20/13 03:35	1
Chlorobenzene	1.0	11	1.0		ug/L			11/20/13 03:35	
1.2-Dichlorobenzene	1.0		1.0		ug/L			11/20/13 03:35	,
1,3-Dichlorobenzene	1.0		1.0		ug/L			11/20/13 03:35	
1,4-Dichlorobenzene	1.0		1.0		ug/L			11/20/13 03:35	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	97		70 - 130					11/20/13 03:35	1
Dibromofluoromethane	111		70 - 130					11/20/13 03:35	1
Toluene-d8 (Surr)	99		70 - 130					11/20/13 03:35	1
Method: RSK-175 - Dissolve	ed Gases (GC)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	1.1	U	1.1		ug/L			11/11/13 11:22	
Ethylene	1.0	U	1.0		ug/L			11/11/13 11:22	
Methane	31		0.58		ug/L			11/11/13 11:22	1
Method: 6010C - Metals (ICI	P) - Total Recoverat	ole							
Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	22		0.050		mg/L		11/11/13 13:32	11/12/13 23:55	
Manganese	1.2		0.010		mg/L		11/11/13 13:32	11/12/13 23:55	1
•						_	D	Analyzed	
Analyte	Result	Qualifier	RL	MDL	Unit	<u>D</u>	Prepared		Dil Fac
Analyte	Result 51	Qualifier	RL 1.0	MDL	Unit mg/L	U	Prepared	11/13/13 14:15	
Analyte Chloride				MDL		<u>U</u>	Prepared		
Analyte Chloride Nitrate as N	51		1.0	MDL	mg/L	<u></u>	Prepared	11/13/13 14:15	1
Analyte Chloride Vitrate as N Sulfate	<b>51</b> 0.050		1.0 0.050	MDL	mg/L mg/L	<u>-</u>	Prepared	11/13/13 14:15 11/08/13 15:59	1
Analyte Chloride Nitrate as N Sulfate Total Organic Carbon	51 0.050 100 1.8		1.0 0.050 25		mg/L mg/L mg/L	<u>D</u>	Prepared	11/13/13 14:15 11/08/13 15:59 11/11/13 15:50	1 1 5
General Chemistry Analyte Chloride Nilrate as N Sulfate Total Organic Carbon Analyte Alkalinity	51 0.050 100 1.8	U	1.0 0.050 25 1.0		mg/L mg/L mg/L mg/L			11/13/13 14:15 11/08/13 15:59 11/11/13 15:50 11/16/13 21:18	Dil Fac

TestAmerica Savannah

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95983-1

SDG: KPS100

Client Sample ID: GWE-5M-F(0.2)-1113

Date Collected: 11/07/13 12:00 Date Received: 11/08/13 10:01 Lab Sample ID: 680-95983-4

Matrix: Water

Method: 6010C - Metals (ICP) - I		Qualifier	RL	MDL	Unit	ם	Prepared	Analyzed	Dil Fac
Iron, Dissolved	23		0.050		mg/L		11/11/13 13:32	11/13/13 00:09	1
Manganese, Dissolved	1.2		0.010		mg/L		11/11/13 13:32	11/13/13 00:09	1
General Chemistry - Dissolved									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	1.7		1.0		mg/L		***************************************	11/13/13 20:05	1

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95983-1

SDG: KPS100

Client Sample ID: GWE-5D-1113

Date Collected: 11/07/13 10:45 Date Received: 11/08/13 10:01 Lab Sample ID: 680-95983-5

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Велгепе	9.6		2.0		ug/L			11/20/13 02:37	2
Chlorobenzene	160		2.0		ug/L			11/20/13 02:37	2
1,2-Dichlorobenzene	4.2		2.0		ug/L			11/20/13 02:37	2
1,3-Dichlorobenzene	2.0	U	2.0		ug/L			11/20/13 02:37	2
1,4-Dichlorobenzene	18		2.0		ug/L			11/20/13 02:37	2
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	104	***************************************	70 - 130					11/20/13 02:37	2
Dibromofluoromethane	99		70 - 130					11/20/13 02:37	2
Toluene-d8 (Surr)	102		70 - 130					11/20/13 02:37	2
Method: RSK-175 - Dissolve	ed Gases (GC)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	1.1	Ŭ	1.1		ug/L			11/11/13 11:10	1
Ethylene	1.0	ឋ	1.0		ug/L			11/11/13 11:10	1
Methane	45		0.58		ug/L			11/11/13 11:10	1
Method: 6010C - Metals (ICI	P) - Total Recoverat	ole							
Analyte	•	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	16		0.050		mg/L		11/11/13 13:32	11/13/13 00:13	1
Manganese ,	0.43	•	0.010	•	mg/L		11/11/13 13:32	11/13/13 00:13	1
0									
General Chemistry		Qualifier	RL	MDL	Unit	Đ	Prepared	Analyzed	Dil Fac
	Result	Qualifier						11/13/13 14:15	
Analyte	Result 94	Qualifier	1.0		mg/L				1
Analyte Chloride	LANGUAGE PROGRAMME CONTRACTOR CON				mg/L mg/L			11/08/13 15:57	1
Analyte Chloride Nitrate as N	94		1.0		-			11/08/13 15:57 11/11/13 16:31	•
Analyte Chloride Nitrate as N Sulfate	<b>94</b> 0.050		1.0 0.050		mg/L				1 1 20 1
Analyte Chloride Nitrate as N Sulfate Total Organic Carbon	94 0.050 460 2.6		1.0 0.050 100	RL	mg/L mg/L	D	Prepared	11/11/13 16:31	20
General Chemistry Analyte Chloride Nitrate as N Sulfate Total Organic Carbon Analyte Alkalinity	94 0.050 460 2.6	U .	1.0 0.050 100 1.0	RL	mg/L mg/L mg/L	D	Prepared	11/11/13 16:31 11/16/13 21:33	20

TestAmerica Savannah

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95983-1

SDG: KPS100

Client Sample ID: GWE-5D-F(0.2)-1113

Date Collected: 11/07/13 10:45 Date Received: 11/08/13 10:01 Lab Sample ID: 680-95983-6

Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	16	F-11-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	0.050	***************************************	mg/L		11/11/13 13:32	11/13/13 00:18	1
Manganese, Dissolved	0.42		0.010		mg/L		11/11/13 13:32	11/13/13 00:18	1

 General Chemistry - Dissolved									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
 Dissolved Organic Carbon	2.5	***************************************	1.0	INVANAVA	mg/L			11/13/13 20:22	1

3

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95983-1

SDG: KPS100

Client Sample ID: GWE-3D-1113

Date Collected: 11/07/13 15:30 Date Received: 11/08/13 10:01 Lab Sample ID: 680-95983-7

Matrix: Water

Method: 8260B - Volatile Or Analyte	•	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	36	**************************************	25		ug/L			11/20/13 02:07	25
Chlorobenzene	1900		25		ug/L			11/20/13 02:07	25
1,2-Dichlorobenzene	25		25		ug/L			11/20/13 02:07	25
1,3-Dichlorobenzene	25	U	25		ug/L			11/20/13 02:07	25
1,4-Dichlorobenzene	160		25		ug/L			11/20/13 02:07	25
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	97	**************************************	70 - 130					11/20/13 02:07	25
Dibromofluoromethane	101		70 - 130					11/20/13 02:07	25
Toluene-d8 (Surr)	99		70 - 130					11/20/13 02:07	25
Method: RSK-175 - Dissolve	ed Gases (GC)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	1.1	U	1,1		ug/L			11/11/13 10:57	1
Ethylene	1.0	U	1.0		ug/L			11/11/13 10:57	1
Methane	35		0.58		ug/L			11/11/13 10:57	1
Method: 6010C - Metals (IC	P) - Total Recoverat	ole							
Analyte	•	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	26	LANCE OF LOCATION OF THE PARTY	0.050		mg/L		11/11/13 13:32	11/13/13 00:22	1
Manganese ,	0.74		0.010	•	mg/Ł		11/11/13 13:32	11/13/13 00:22	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	870	221714-V4.49241	10		mg/L			11/13/13 15:04	10
Chloride	0.0		0.050		mg/L			11/08/13 15:55	1
	0.050	U	0,000		mg/L			11/11/13 16:31	20
Nitrate as N		U	100		mg/L				20
Nitrate as N Sulfate	0.050	U			mg/L			11/16/13 21:47	1
Nitrate as N Sulfate Fotal Organic Carbon	0.050 410 4.9	U Qualifier	100	RL		D	Prepared	11/16/13 21:47 Analyzed	
Chloride Nitrate as N Sulfate Total Organic Carbon Analyte Alkalinity	0.050 410 4.9		100 1.0	RL	mg/L	<u>D</u>	Prepared		1

TestAmerica Savannah

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95983-1

SDG: KPS100

Client Sample ID: GWE-3D-F(0.2)-1113

Date Collected: 11/07/13 15:30 Date Received: 11/08/13 10:01 Lab Sample ID: 680-95983-8

Matrix: Water

Method: 6010C - Metals (ICP) - Di	ssolved								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	26	************	0,050		mg/L		11/11/13 13:32	11/13/13 00:27	1
Manganese, Dissolved	0.76		0.010		mg/L		11/11/13 13:32	11/13/13 00:27	1
General Chemistry - Dissolved									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	4.8		1.0	The second secon	mg/L			11/13/13 20:36	1

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16

Client: Solutia Inc.

Dibromofluoromethane

Toluene-d8 (Surr)

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95983-1

SDG: KPS100

Client Sample ID: 4Q13 LTM Trip Blank #4

Date Collected: 11/07/13 00:00 Date Received: 11/08/13 10:01 Lab Sample ID: 680-95983-9

11/20/13 00:39

11/20/13 00:39

Matrix: Water

Method: 8260B - Volatile Or	ganic Compounds	(GC/MS)						
Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	Ū	1.0	ug/L			11/20/13 00:39	1
Chlorobenzene	1.0	U	1.0	ug/L			11/20/13 00:39	1
1,2-Dichtorobenzene	1.0	U	1.0	ug/L			11/20/13 00:39	1
1,3-Dichlorobenzene	1.0	U	1,0	ug/L			11/20/13 00:39	1
1,4-Dichlorobenzene	1.0	U	1.0	ug/L			11/20/13 00:39	1
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	100		70 - 130				11/20/13 00:39	1

70 - 130

70 - 130

109

99

8

### **Surrogate Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95983-1

SDG: KP\$100

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water Prep Type: Total/NA

				Percent Surr	ogate Recovery (Acceptance Limits)
		BFB	DBFM	TOL	
Lab Sample ID	Client Sample ID	(70-130)	(70-130)	(70-130)	
680-95983-1	GWE-5S-1113	97	109	100	
680-95983-3	GWE-5M-1113	97	111	99	
680-95983-5	GWE-5D-1113	104	99	102	
680-95983-7	GWE-3D-1113	97	101	99	
680-95983-9	4Q13 LTM Trip Blank #4	100	109	99	
LCS 680-304108/4	Lab Control Sample	96	104	104	
LCSD 680-304108/5	Lab Control Sample Dup	101	99	104	
MB 680-304108/8	Method Blank	97	109	100	

Surrogate Legend

BFB = 4-Bromofluorobenzene

DBFM = Dibromofluoromethane

TOL = Toluene-d8 (Surr)

TestAmerica Savannah

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95983-1

SDG: KP\$100

### Method: 8260B - Volatile Organic Compounds (GC/MS)

A4D 440

100

Client Sample ID: Method Blank Lab Sample ID: MB 680-304108/8 Prep Type: Total/NA Matrix: Water

Analysis Batch: 304108

	WR	WR						
Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	Ü	1.0	ug/L			11/20/13 00:09	1
Chlorobenzene	1.0	U	1.0	ug/L			11/20/13 00:09	1
1,2-Dichlorobenzene	1.0	U	1.0	ug/L			11/20/13 D0:09	1
1,3-Dichlorobenzene	1,0	U	1.0	ug/L			11/20/13 00:09	1
1,4-Dichlorobenzene	1.0	ប	1.0	ug/L			11/20/13 00:09	1
	MB	МВ						
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac
4-Bromofluarobenzene	97	20,0111,0000,000	70 - 130				11/20/13 00:09	1
Dibromofluoromethane	109		70 - 130				11/20/13 00:09	1

70 - 130

Lab Sample ID: LCS 680-304108/4

Matrix: Water

Analysis Batch: 304108

Toluene-d8 (Surr)

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

11/20/13 00:09

	Spike	LCS	LUS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Benzene	50.0	53.1		ug/L		106	74 - 123	
Chlorobenzene	50.0	51.4		ug/L		103	79 - 120	
1,2-Dichlorobenzene	50.0 `	53.2		ug/L	,	106	77 - 124	· ·
1,3-Dichlorobenzene	50.0	52.1		ug/L		104	79 - 123	
1,4-Dichlorobenzene	50.0	51.4		ug/L		103	76 . 124	
\$								

LCS LCS Surrogate %Recovery Qualifier Limits 4-Bromofluorobenzene 96 70 - 130 Dibromofluoromethane 104 70 - 130 Toluene-d8 (Surr) 70 - 130 104

Lab Sample ID: LCSD 680-304108/5

Matrix: Water

Analysis Batch: 304108

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

•	Spike	LCSD	LCSD			%Rec.		RPD
Analyte	Added	Result	Qualifier Unit	D	%Rec	Limits	RPD	Limit
Benzene.	50,0	. 52.0	ug/L		. 104	74 - 123	2	30
Chlorobenzene	50.0	52.3	ug/L		105	79 - 120	2	30
1,2-Dichlorobenzene	50.0	52.5	ug/L		105	77 - 124	1	30
1,3-Dichlorobenzene	50.0	52.5	ug/L		105	79 123	1	30
1,4-Dichlorobenzene	50.0	52.9	ug/L		106	76 - 124	3	30

	LCSD	LCSD	
Surrogate	%Recovery	Qualifier	Limits
4-Bromofluorobenzene	101	Produced by Property and Proper	70 - 130
Dibromofluoromethane	99		70 - 130
Toluene-d8 (Surr)	104		70 130

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95983-1

SDG: KPS100

Method: RSK-175 - Dissolved Gases (GC)

Lab Sample ID: MB 680-302485/3

Matrix: Water

Analysis Batch: 302485

Client Sample ID: Method Blank Prep Type: Total/NA

мв мв Analyzed Dil Fac Analyte Result Qualifier MDL Unit Prepared RL Ethane 1.1 U 1.1 11/11/13 09:53 ug/L 11/11/13 09:53 ug/L Ethylene 1.0 U 1.0 11/11/13 09:53 Methane 0.58 U 0.58 ug/L

Lab Sample ID: LCS 680-302485/4

Matrix: Water

Analysis Batch: 302485

Client Sample ID: Lab Control Sample Prep Type: Total/NA

%Rec.

LCS LCS Spike Analyte Added Result Qualifier Unit Limits %Rec 288 285 99 75 . 125 Ethane ug/L 75 - 125 Ethylene 269 ug/L 99 266 75 - 125 Methane 154 144 ug/L 93

Lab Sample ID: LCSD 680-302485/5

Matrix: Water

Analysis Batch: 302485

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	Đ	%Rec	Limits	RPD	Limit
Ethane	288	287		ug/L		99	75 _ 125	1	30
Ethylene	269	267		ug/L		99	75 - 125	ì	30
Methane	154	145		ug/L		95	75 - 125	1	30
300									

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-302642/1-A

Matrix: Water

Analysis Batch: 303006

Client Sample ID: Method Blank Prep Type: Total Recoverable

Prep Batch: 302642

		MB	MB							
	Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Iron	0.050	Ū	0,050		mg/L	_	11/11/13 13:32	11/12/13 23:18	1
-	Iron, Dissolved	0.050	U	0.050		mg/L		11/11/13 13:32	11/12/13 23:18	1
	Manganese	0.010	U	0.010		mg/L		11/11/13 13:32	11/12/13 23:18	1
	Manganese, Dissolved	0.010	U	0.010		mg/L		11/11/13 13:32	11/12/13 23:18	1

Lab Sample ID: LCS 680-302642/2-A

Matrix: Water

Analysis Batch: 303006

Client Sample ID: Lab Control Sample Prep Type: Total Recoverable

Prep Batch: 302642

	Spike	LCS	LCS			%Rec.	
Analyte	Added	Result	Qualifier Unit	D	%Rec	Limits	
<b>!ron</b>	5.00	5.33	mg/L		107	75 - 125	
iron, Dissolved	5.00	5.33	mg/L		107	75 - 125	
Manganese	0.500	0,503	mg/L		101	75 _ 125	
Manganese, Dissolved	0.500	0.503	mg/L		101	75 - 125	

TestAmerica Savannah

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95983-1

SDG: KPS100

(Continued)	•
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Lab Sample ID: 680-95983-1 MS						Client Sample ID: GWE-5S-1113
Matrix: Water						Prep Type: Total Recoverable
Analysis Batch: 303006						Prep Batch: 302642
	Sample	Sample	Spike	MS	MS	%Rec.

i		Sample	Sample	Spike	MS	MS				%Rec.			
	Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits			
	Iron	0.050	U	5.00	5,35	*****************	mg/L		106	75 - 125	~	the defendance de transporte de	
-	Iron, Dissolved	0.050		5.00	5.35		mg/L		106	75 - 125			
	Manganese	0.24		0.500	0.749		mg/L		102	75 - 125			
i	Manganese Dissolved	0.24		0.500	n 740		mall		102	75 125			

Lab Sample ID: 680-95983-1 MSD

Client Sample ID: GWE-5S-1113

Matrix: Water

Matrix: Water Prep Type: Total Recoverable
Analysis Batch: 303006 Prep Batch: 302642

- 2	Analysis Daton, 000000									псрі	Daten.	JUEU4E
-		Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
200	Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
	Iron	0.050	U	5.00	5.36	2-1411111111111111111111111111111111111	mg/L		106	75.125	0	20
-	Iron, Dissolved	0.050		5,00	5.36		mg/L		106	75 - 125	0	20
	Manganese	0.24		0.500	0.755		mg/L		103	75 - 125	1	20
	Manganese, Dissolved	0.24		0.500	0.755		mg/L		103	75 - 125	1	20
,	****											

### Method: 310.1 - Alkalinity

Alkalinity

Carbon Dioxide, Free

i	Lab Sample ID: MB 680-303855/5		Client Sample ID: Method Blank
i	Matrix: Water ,	,	, Prep Type: Total/NA
ı	Analysis Patch: 202055		

i		MB	MB								
	Analyte	Result	Qualifier	RL	RL	Unit	Đ	Prepared	Analyzed	Dil Faç	
	Alkalinity	5.0	U	5.0	**************************************	mg/L			11/18/13 11:46	1	
į	Carbon Dioxide, Free	5.0	11	5.0		moli			11/18/13 11:46	1	

Lab Sample ID: LCS 680-303855/6	Client Sample ID: Lab Control Sample
Matrix: Water	Prep Type: Total/NA
Analysis Batch: 303855	

		Spike	LCS	LCS				%Rec.	
Analyte		Added	Result	Qualifier	Unit	Ð	%Rec	Limits	
Alkalinity	***************************************	250	211		mo/!	74.50	84	80 - 120	 ************

Lab Sample ID: LCSD 680-303855/32 Matrix: Water Analysis Batch: 303855			Clie	ent Sam	ple ID: I	Lab Contro Prep T	ol Sampl Type: Tot	
-	Spike	LCSD LCSD				%Rec.		RPD
Analyte	Added	Result Qualifier	Unit	D	%Rec	Limits	RPD	Limit

mg/L

Lab Sample ID: 680-95983-5 D Matrix: Water Analysis Batch: 303855	U						С	lient Sample I Pre	D: GWE-5I o Type: To	
Allarysis Datell. 303035		Sample	Sample	DU	DU					RPD
Analyte		Result	Qualifier	Result	Qualifier	Unit	D		RPD	Limit
Alkalinity	**************	330		 319		mg/L			4	30

TestAmerica Savannah

80 - 120

RL

1.0

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95983-1

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

SDG: KPS100

Method: 325.2 - Ch	loride
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Lab Sample ID: MB 680-303120/47

Matrix: Water

Analysis Batch: 303120

MB MB

Analyte Result Qualifier

1.0 U

MDL Unit mg/L

Analyzed 11/13/13 15:15 Dil Fac

Lab Sample ID: LCS 680-303120/6

Matrix: Water

Chloride

Analysis Batch: 303120

Analyte Chloride

Spike Added 50.0

LCS LCS Result Qualifier 50.0

Unit D mg/L

%Rec. Limits 85 - 115

%Rec

100

Client Sample ID: Lab Control Sample

Lab Sample ID: MB 680-303121/42

Matrix: Water

Analysis Batch: 303121

Analyte Result Qualifier Chloride 1.0 ป

RL 1.0 MDL Unit mg/L Prepared

Analyzed 11/13/13 15:15

Client Sample ID: Lab Control Sample

Client Sample ID: Method Blank

Dil Fac

Lab Sample ID: LCS 680-303121/7

Matrix: Water

Chloride

Analysis Batch: 303121

Analyte

Spike Added 50.0

LCS LCS Result Qualifier 50.1

Unit D mg/L

%Rec Limits 100 85 - 115

%Rec.

Prep Type: Total/NA

#### Method: 353.2 - Nitrogen, Nitrate-Nitrite

Lab Sample ID: MB 680-302424/13

Matrix: Water

Analysis Batch: 302424

MB MB

0.050 ป

Analyte Nitrate as N Result Qualifier

0.050

MDL Unit

Analyzed

Prep Type: Total/NA

Client Sample ID: Method Blank

Dil Fac 11/08/13 15:49

Lab Sample ID: LCS 680-302424/14

Matrix: Water

Analysis Batch: 302424

mg/L

Client Sample ID: Lab Control Sample Prep Type: Total/NA

Spike LCS LCS %Rec. %Rec Limits Analyte Added Result Qualifier Unit 90.110 Nitrate as N 0.497 0.522 mg/L 105 Nitrate Nitrite as N 0.997 1.02 mg/L 103 90.110 Nitrite as N 0.500 0.502 mg/L 100 90 - 110

Method: 375.4 - Sulfate

Lab Sample ID: MB 680-302727/19

Matrix: Water

Analyte

Sulfate

Analysis Batch: 302727

мв мв

Result Qualifier 5.0 U

MDL Unit mg/L Prepared

Analyzed 11/11/13 16:27

Client Sample ID: Method Blank

Dil Fac

TestAmerica Savannah

Prep Type: Total/NA

DEC 0 9 2013

RL

5.0

Client: Solutia Inc.

Matrix: Water

Sulfate

Analyte

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95983-1

SDG: KPS100

Method: 375.4 - Sulfate (Continued)

Lab Sample ID: LCS 680-302727/18

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analysis Batch: 302727

Analyte

Spike Added 20.0

Spike

Added

20.0

LCS LCS Result Qualifier

20.1

Unit

mg/L

Unit

mg/L

%Rec

100

%Rec. 75 - 125

Limits

Client Sample ID: Method Blank

Method: 415.1 - DOC

Lab Sample ID: MB 680-303261/6

Matrix: Water

Analysis Batch: 303261

Dissolved Organic Carbon

1.0 U

MB MB Result Qualifier

MDL Unit mg/L

LCS LCS

17.3

Result Qualifier

RL

1,0

Prepared

%Rec

86

Analyzed Dil Fac

Prep Type: Dissolved

11/13/13 14:43

Lab Sample ID: LCS 680-303261/5

Matrix: Water

Analysis Batch: 303261

Analyte

Dissolved Organic Carbon

Client Sample ID: Lab Control Sample Prep Type: Dissolved

%Rec.

Limits

80 - 120

Client Sample ID: Method Blank

Prep Type: Total/NA

Method: 415.1 - TOC

Lab Sample ID: MB 680-303829/26

Matrix: Water

Analysis Batch: 303829

Analyte Total Organic Carbon Result Qualifier

RL 1.0

Spike

Added

20.0

MDL Unit

Qualifier

LCS LCS

Result

20.8

Analyzed Prepared

Dil Fac

Lab Sample ID: LCS 680-303829/29

Matrix: Water

Total Organic Carbon

Analysis Batch: 303829

Analyte

1.0 U

mg/L

11/16/13 17:13

Client Sample ID: Lab Control Sample Prep Type: Total/NA

%Rec.

Unit %Rec Limits mg/L 104 80 - 120

### **QC Association Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95983-1

SDG: KPS100

### GC/MS VOA

Analysis Batch: 304108

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-95983-1	GWE-5S-1113	Total/NA	Water	8260B	
680-95983-3	GWE-5M-1113	Total/NA	Water	8260B	
680-95983-5	GWE-5D-1113	Total/NA	Water	8260B	
680-95983-7	GWE-3D-1113	Total/NA	Water	8260B	
680-95983-9	4Q13 LTM Trip Blank #4	Totai/NA	Water	8260B	
LCS 680-304108/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-304108/5	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 680-304108/8	Method Blank	Total/NA	Water	8260B	

### GC VOA

Analysis Batch: 302485

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-95983-1	GWE-5S-1113	Total/NA	Water	RSK-175	
680-95983-3	GWE-5M-1113	Total/NA	Water	RSK-175	
680-95983-5	GWE-5D-1113	Total/NA	Water	RSK-175	
680-95983-7	GWE-3D-1113	Total/NA	Water	RSK-175	
LCS 680-302485/4	Lab Control Sample	Total/NA	Water	RSK-175	
LCSD 680-302485/5	Lab Control Sample Dup	Total/NA	Water	RSK-175	
MB 680-302485/3	Method Blank	Total/NA	Water	RSK-175	

#### Metals

Prep Batch: 302642

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batcl
680-95983-1	GWE-5S-1113	Total Recoverable	Water	3005A	
680-95983-1 MS	GWE-5S-1113	Total Recoverable	Water	3005A	
680-95983-1 MSD	GWE-5\$-1113	Total Recoverable	Water	3005A	
680-95983-2	GWE-5S-F(0.2)-1113	Dissolved	Water	3005A	
680-95983-3	GWE-5M-1113	Total Recoverable	Water	3005A	
680-95983-4	GWE-5M-F(0.2)-1113	Dissolved	Water	3005A	
680-95983-5	GWE-5D-1113	Total Recoverable	Water	3005A	
680-95983-6	GWE-5D-F(0.2)-1113	Dissolved	Water	3005A	
680-95983-7	GWE-3D-1113	Total Recoverable	Water	3005A	
680-95983-8	GWE-3D-F(0.2)-1113	Dissolved	Water	3005A	
LCS 680-302642/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
MB 680-302642/1-A	Method Blank	Total Recoverable	Water	3005A	

### Analysis Batch: 303006

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-95983-1	GWE-5\$-1113	Total Recoverable	Water	6010C	302642
680-95983-1 MS	GWE-5\$-1113	Total Recoverable	Water	6010C	302642
680-95983-1 MSD	GWE-5S-1113	Total Recoverable	Water	6010C	302642
680-95983-2	GWE-5S-F(0.2)-1113	Dissolved	Water	6010C	302642
680-95983-3	GWE-5M-1113	Total Recoverable	Water	6010C	302642
680-95983-4	GWE-5M-F(0.2)-1113	Dissolved	Water	6010C	302642
680-95983-5	GWE-5D-1113	Total Recoverable	Water	6010C	302642
680-95983-6	GWE-5D-F(0.2)-1113	Dissolved	Water	6010C	302642
680-95983-7	GWE-3D-1113	Total Recoverable	Water	6010C	302642
680-95983-8	GWE-3D-F(0.2)-1113	Dissolved	Water	6010C	302642

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### **QC Association Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95983-1

SDG: KPS100

Analysis Batch: 30300	6 (Continued)				
	o (Continued)				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 680-302642/2-A	Lab Control Sample	Total Recoverable	Water	6010C	302642
MB 680-302642/1-A	Method Blank	Total Recoverable	Water	6010C	302642
General Chemistry	/				***************************************
Analysis Batch: 30242	4				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batcl
680-95983-1	GWE-5S-1113	Total/NA	Water	353.2	
680-95983-3	GWE-5M-1113	Total/NA	Water	353,2	
680-95983-5	GWE-5D-1113	Total/NA	Water	353,2	
680-95983-7	GWE-3D-1113	Total/NA	Water	353.2	
LCS 680-302424/14	Lab Control Sample	Totai/NA	Water	353.2	
MB 680-302424/13	Method Blank	Total/NA	Water	353.2	
nalysis Batch: 30272	7				
Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batc
680-95983-1	GWE-5S-1113	Total/NA	Water	375.4	
680-95983-3	GWE-5M-1113	Total/NA	Water	375.4	
680-95983-5	GWE-5D-1113	Total/NA	Water	375,4	
680-95983-7	GWE-3D-1113	Total/NA	Water	375.4	
LCS 680-302727/18	Lab Control Sample	Total/NA	Water	375.4	
MB 680-302727/19	Method Blank	Total/NA	Water	375.4	
nalysis Batch: 30312			., _, _,		
		Denn Toma	Matrix	Method	Prep Batc
Lab Sample ID 680-95983-7	Client Sample ID GWE-3D-1113	Prep Type Total/NA	Water	325.2	- riep batc
LCS 680-303120/6		Total/NA	Water	325.2	
	Lab Control Sample				
MB 680-303120/47	Method Blank	Total/NA	Water	325.2	
nalysis Batch: 30312	1				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batc
680-95983-1	GWE-5S-1113	Total/NA	Water	325.2	
	GWE-5S-1113 GWE-5M-1113		water Water	325.2 325.2	
680-95983-3		Total/NA			
680-95983-3 680-95983-5	GWE-5M-1113 GWE-5D-1113	Total/NA Total/NA Total/NA	Water	325.2	
680-95983-3 680-95983-5 LCS 680-303121/7	GWE-5M-1113	Total/NA Total/NA	Water Water	325.2 325.2	
	GWE-5M-1113 GWE-5D-1113 Lab Control Sample Method Blank	Total/NA Total/NA Total/NA Total/NA	Water Water Water	325.2 325.2 325.2	
680-95983-3 680-95983-5 LCS 680-303121/7 MB 680-303121/42 nalysis Batch: 30326	GWE-5M-1113 GWE-5D-1113 Lab Control Sample Method Blank	Total/NA Total/NA Total/NA Total/NA	Water Water Water	325.2 325.2 325.2	· Prep Bato
680-95983-3 680-95983-5 LCS 680-303121/7 MB 680-303121/42 nalysis Batch: 30326 Lab Sample ID	GWE-5M-1113 GWE-5D-1113 Lab Control Sample Method Blank	Total/NA Total/NA Total/NA Total/NA Total/NA	Water Water Water Water	325.2 325.2 325.2 325.2	Prep Batc
680-95983-3 680-95983-5 LCS 680-303121/7 MB 680-303121/42 nalysis Batch: 30326 Lab Sample ID 680-95983-2	GWE-5M-1113 GWE-5D-1113 Lab Control Sample Method Blank i1 Client Sample ID	Total/NA Total/NA Total/NA Total/NA Total/NA Prep Type	Water Water Water Water	325.2 325.2 325.2 325.2 Method	Prep Batc
680-95983-3 680-95983-5 LCS 680-303121/7 M8 680-303121/42 nalysis Batch: 30326 Lab Sample ID 680-95983-2 680-95983-4	GWE-5M-1113 GWE-5D-1113 Lab Control Sample Method Blank  Client Sample ID GWE-5S-F(0.2)-1113 GWE-5M-F(0.2)-1113	Total/NA Total/NA Total/NA Total/NA Total/NA Prep Type Dissolved	Water Water Water Water  Matrix Water	325.2 325.2 325.2 325.2 Method	Prep Batc
680-95983-3 680-95983-5 LCS 680-303121/7 MB 680-303121/42 nalysis Batch: 30326 Lab Sample ID 680-95983-2 680-95983-4 680-95983-6	GWE-5M-1113 GWE-5D-1113 Lab Control Sample Method Blank  Client Sample ID GWE-5S-F(0.2)-1113 GWE-5M-F(0.2)-1113	Total/NA Total/NA Total/NA Total/NA Total/NA Prep Type Dissolved Dissolved Dissolved	Water Water Water  Matrix  Water  Water  Water  Water	325.2 325.2 325.2 325.2 Method 415.1 415.1	Prep Batc
680-95983-3 680-95983-5 LCS 680-303121/7 MB 680-303121/42 nalysis Batch: 30326 Lab Sample ID 680-95983-2 680-95983-4 680-95983-6 680-95983-8	GWE-5M-1113 GWE-5D-1113 Lab Control Sample Method Blank  Client Sample ID GWE-5S-F(0.2)-1113 GWE-5D-F(0.2)-1113 GWE-3D-F(0.2)-1113	Total/NA Total/NA Total/NA Total/NA Total/NA  Prep Type Dissolved Dissolved Dissolved	Water Water Water  Matrix Water  Water  Water  Water  Water  Water	325.2 325.2 325.2 325,2 Method 415.1 415.1 415.1	Prep Bato
680-95983-3 680-95983-5 LCS 680-303121/7 MB 680-303121/42 nalysis Batch: 30326 Lab Sample ID 680-95983-2 680-95983-4 680-95983-8 LCS 680-303261/5	GWE-5M-1113 GWE-5D-1113 Lab Control Sample Method Blank  Client Sample ID GWE-5S-F(0.2)-1113 GWE-5M-F(0.2)-1113	Total/NA Total/NA Total/NA Total/NA Total/NA Prep Type Dissolved Dissolved Dissolved	Water Water Water  Matrix  Water  Water  Water  Water	325.2 325.2 325.2 325.2 Method 415.1 415.1	Prep Bato
680-95983-3 680-95983-5 LCS 680-303121/7 MB 680-303121/42 Analysis Batch: 30326 Lab Sample ID 680-95983-2 680-95983-4 680-95983-6 680-95983-8 LCS 680-303261/5 MB 680-303261/6	GWE-5M-1113 GWE-5D-1113 Lab Control Sample Method Blank  Client Sample ID GWE-5S-F(0.2)-1113 GWE-5M-F(0.2)-1113 GWE-5D-F(0.2)-1113 Lab Control Sample Method Blank	Total/NA Total/NA Total/NA Total/NA Total/NA  Prep Type Dissolved Dissolved Dissolved Dissolved Dissolved	Water Water Water  Matrix Water Water Water Water Water Water Water Water	325.2 325.2 325.2 325.2 Method 415.1 415.1 415.1 415.1	Prep Bato
680-95983-3 680-95983-5 LCS 680-303121/7 MB 680-303121/42 nalysis Batch: 30326 Lab Sample ID 680-95983-2 680-95983-4 680-95983-8 LCS 680-303261/5 MB 680-303261/6 nalysis Batch: 30382	GWE-5M-1113 GWE-5D-1113 Lab Control Sample Method Blank  Client Sample ID GWE-5S-F(0.2)-1113 GWE-5M-F(0.2)-1113 GWE-5D-F(0.2)-1113 GWE-3D-F(0.2)-1113 Lab Control Sample Method Blank	Total/NA Total/NA Total/NA Total/NA Total/NA Prep Type Dissolved Dissolved Dissolved Dissolved Dissolved Dissolved	Water Water Water  Matrix Water Water Water Water Water Water Water Water Water Water Water	325.2 325.2 325.2 325.2 Method 415.1 415.1 415.1 415.1	
680-95983-3 680-95983-5 LCS 680-303121/7 MB 680-303121/42 Analysis Batch: 30326 Lab Sample ID 680-95983-2 680-95983-4 680-95983-8 LCS 680-303261/5	GWE-5M-1113 GWE-5D-1113 Lab Control Sample Method Blank  Client Sample ID GWE-5S-F(0.2)-1113 GWE-5M-F(0.2)-1113 GWE-5D-F(0.2)-1113 Lab Control Sample Method Blank	Total/NA Total/NA Total/NA Total/NA Total/NA  Prep Type Dissolved Dissolved Dissolved Dissolved Dissolved	Water Water Water  Matrix Water Water Water Water Water Water Water Water	325.2 325.2 325.2 325.2 Method 415.1 415.1 415.1 415.1 415.1	Prep Batc

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### **QC Association Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95983-1

SDG: KPS100

### General Chemistry (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-95983-5	GWE-5D-1113	Total/NA	Water	415.1	
680-95983-7	GWE-3D-1113	Total/NA	Water	415.1	}
LCS 680-303829/29	Lab Control Sample	Total/NA	Water	415.1	
MB 680-303829/26	Method Blank	Total/NA	Water	415.1	

### Analysis Batch: 303855

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-95983-1	GWE-5S-1113	Total/NA	Water	310.1	
680-95983-3	GWE-5M-1113	Total/NA	Water	310,1	
680-95983-5	GWE-5D-1113	Total/NA	Water	310.1	
680-95983-5 DU	GWE-5D-1113	Total/NA	Water	310,1	
680-95983-7	GWE-3D-1113	Total/NA	Water	310.1	
LCS 680-303855/6	Lab Control Sample	Total/NA	Water	310.1	
LCSD 680-303855/32	Lab Control Sample Dup	Total/NA	Water	310.1	
MB 680-303855/5	Method Blank	Total/NA	Water	310.1	

TestAmerica Savannah

DEC 0 \$ 2013

#### Lab Chronicle

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95983-1

SDG: KPS100

Client Sample ID: GWE-5S-1113

Date Collected: 11/07/13 13:40 Date Received: 11/08/13 10:01 Lab Sample ID: 680-95983-1

Matrix: Water

Total/NA Analysis 8260B 1 304108 11/20/13 03:06 JD1 TA	TAL SAV
Tolal/NA Analysis RSK-175 1 302485 11/11/13 11:35 TF1 TA	TAL SAV
	1712 0714
Total Recoverable Prep 3005A 302642 11/11/13 13:32 BJB TA	TAL SAV
Total Recoverable Analysis 6010C 1 303006 11/12/13 23:27 BCB TA	TAL SAV
Total/NA Analysis 353.2 1 302424 11/08/13 16:00 CRW TA	TAL SAV
Total/NA Analysis 375.4 5 302727 11/11/13 16:27 JME TA	TAL SAV
Total/NA Analysis 325.2 1 303121 11/13/13 14:15 JME TA	TAL SAV
Total/NA Analysis 415.1 1 303829 11/16/13 21:04 CMP TA	TAL SAV
Total/NA Analysis 310.1 1 303855 11/18/13 12:33 LBH TA	TAL SAV

Client Sample ID: GWE-5S-F(0.2)-1113

Date Collected: 11/07/13 13:40

Date Received: 11/08/13 10:01

Lab Sample ID: 680-95983-2

Matrix: Water

 •	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Ргер	3005A			302642	11/11/13 13:32	8JB	TAL SAV
Dissolved	Analysis	6010C		1	303006	11/12/13 23:50	8CB	TAL SAV
 Dissolved	Analysis	415.1		1	303261	11/13/13 19:15	CMP	TAL SAV

Client Sample ID: GWE-5M-1113

Date Collected: 11/07/13 12:00

Date Received: 11/08/13 10:01

Lab	Sample	ID: 6	80-9598	3-3
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Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	304108	11/20/13 03;35	JD1	TAL SAV
Total/NA	Analysis	RSK-175		1	302485	11/11/13 11:22	TF1	TAL SAV
Total Recoverable	Ргер	3005A			302642	11/11/13 13:32	BJB	TAL SAV
Total Recoverable	Analysis	6010C		1	303006	11/12/13 23:55	BCB	TAL SAV
Total/NA	Analysis	353.2		1	302424	11/08/13 15:59	CRW	TAL SAV
Total/NA	Analysis	375.4		5	302727	11/11/13 15:50	JME	TAL SAV
Total/NA	Analysis	325.2		1	303121	11/13/13 14:15	JME	TAL SAV
Total/NA	Analysis	415.1		1	303829	11/16/13 21:18	CMP	TAL SAV
Total/NA	Analysis	310.1		1	303855	11/18/13 12:41	LBH	TAL SAV

Client Sample ID: GWE-5M-F(0.2)-1113

Date Collected: 11/07/13 12:00 Date Received: 11/08/13 10:01 Lab Sample ID: 680-95983-4

Matrix: Water

		Batch	Batch		Dilution	Batch	Prepared		
i	Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
	Dissolved	Prep	3005A			302642	11/11/13 13:32	BJB	TAL SAV
	Dissolved	Analysis	6010C		1	303006	11/13/13 00:09	BC8	TAL SAV

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DEC \$ 9 2013

#### Lab Chronicle

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95983-1

SDG: KPS100

Client Sample ID: GWE-5M-F(0.2)-1113

Date Collected: 11/07/13 12:00 Date Received: 11/08/13 10:01

Lab Sample ID: 680-95983-4

Matrix: Water

Batch Batch Prep Type

Dilution Batch Prepared Method Type Run Factor Number or Analyzed Analyst Lab Dissolved Analysis 415.1 303261 11/13/13 20:05 CMP TAL SAV

Lab Sample ID: 680-95983-5

Matrix: Water

Client Sample ID: GWE-5D-1113

Date Collected: 11/07/13 10:45 Date Received: 11/08/13 10:01

	Batch	Batch		Dilution	Batch	Prepared		
Ргер Туре	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		2	304108	11/20/13 02:37	JD1	TAL SAV
Total/NA	Analysis	RSK-175		1	302485	11/11/13 11:10	TF1	TAL SAV
Total Recoverable	Prep	3005A			302642	11/11/13 13:32	BJ8	TAL SAV
Total Recoverable	Analysis	6010C		1	303006	11/13/13 00:13	BCB	TAL SAV
Total/NA	Analysis	353.2		1	302424	11/08/13 15:57	CRW	TAL SAV
Total/NA	Analysis	375,4		20	302727	11/11/13 16:31	JME	TAL SAV
Total/NA	Analysis	325.2		1	303121	11/13/13 14:15	JME	TAL SAV
Total/NA	Analysis	415.1		1	303829	11/16/13 21:33	CMP	TAL SAV
Total/NA	Analysis	310.1		1	303855	11/18/13 12:49	LBH	TAL SAV
**								

Client Sample ID: GWE-5D-F(0.2)-1113

Date Collected: 11/07/13 10:45

Date Received: 11/08/13 10:01

Lab Sample ID: 680-95983-6

Matrix: Water

t e	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			302642	11/11/13 13:32	BJB	TAL SAV
Dissolved	Analysis	6010C		1	303006	11/13/13 00:18	BCB	TAL SAV
Dissolved	Analysis	415.1		1	303261	11/13/13 20:22	CMP	TAL SAV

Client Sample ID: GWE-3D-1113

Date Collected: 11/07/13 15:30

Date Received: 11/08/13 10:01

Lab Samp	le ID:	680-95	5983-7
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Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		25	304108	11/20/13 02:07	JD1	TAL SAV
Total/NA	Analysis	RSK-175		1	302485	11/11/13 10:57	TF1	TAL SAV
Total Recoverable	Prep	3005A			302642	11/11/13 13:32	BJB	TAL SAV
Total Recoverable	Analysis	6010C		1	303006	11/13/13 00:22	BCB	TAL SAV
Total/NA	Analysis	353.2		1	302424	11/08/13 15:55	CRW	TAL SAV
Total/NA	Analysis	375.4		20	302727	11/11/13 16:31	JME	TAL SAV
Total/NA	Analysis	325.2		10	303120	11/13/13 15:04	JME	TAL SAV
Total/NA	Analysis	415.1		1	303829	11/16/13 21:47	CMP	TAL SAV
Total/NA	Analysis	310.1		1	303855	11/18/13 13:08	LBH	TAL SAV

#### Lab Chronicle

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303006

303261

11/13/13 00:27

Client: Solutia Inc.

Dissolved

Dissolved

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

6010C

415.1

TestAmerica Job ID: 680-95983-1

SDG: KPS100

Client Sample ID: GWE-3D-F(0.2)-1113

Date Collected: 11/07/13 15:30 Date Received: 11/08/13 10:01 Lab Sample ID: 680-95983-8

Matrix: Water

Batch Batch Dilution Batch Prepared Prep Type Type Method Run Factor Number or Analyzed Analyst Lab Dissolved Prep 3005A 302642 11/11/13 13:32 BJB TAL SAV

11/13/13 20:36 CMP TAL SAV

TAL SAV

BCB

Client Sample ID: 4Q13 LTM Trip Blank #4

Analysis

Analysis

Date Collected: 11/07/13 00:00

Lab Sample ID: 680-95983-9

Matrix: Water

Date Received: 11/08/13 10:01

Batch Batch Dilution Batch Prepared Prep Type Method Type Run Factor Number or Analyzed Analyst Total/NA Analysis 8260B 304108 11/20/13 00:39 JD1 TAL SAV

Laboratory References:

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

1/2

16

THE LEADER IN ENVIRONMENTAL TESTING **TestAmerica** TestAmerica Laboratories, Inc. 8 Months Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month) 1.4.6 08/13 Date/Time: Date/Time: COC No: Archive For Company: Disposal By Lab Company: Company DOC PA 412.1 1 3,1 2 4 Diesolved Fe/Mn by 6010C Chain of Custody Record Site Contact: Michael Corbett FOC by 415.1 Lab Contact: Michele Kersey Return To Client М ~ 3 Dissolved Gases by RSK 175 ---Chloride by 325.1Shiffate by 375.4 Received by: Received by: Received by: <u>بسر</u> VIF/CO3 P\$ 310'1 -----Fotal ForMit by 6010C ₩ AOC? Py 8260B 3 1.7 3 3 ~ elitered Sample IAT IT different from Below SALM BAND # of Cont 2 2 끘 7 Date/Time: Water Wafer Water Water Water Water Water Water Water Matrix Analysis Turnaround Time Calendar (C) or Work Days (W) Sample Type Project Manager: Bob Billman Ċ ڻ ڻ Ċ Ġ Ů ٥ O 2 weeks I week 2 days l day FelFax: (314) 743-4108 1530 1530 500 3 Sample Тішс S S S Q 010 80 URS 11/2/13 Preservation Used: 1 = Ice, 2 = HCl; 3 = H2SO4; 4 = HNO3; 5 = NaOH; 6 = Other Sample Date Company: Company: Company: Skin Irritant Special Instructions/QC Requirements & Comments: GWE-3D-F(0.2)-1115 GWE-SD-F(0.2)-1113 4Q13 LTM Trip Blank # 1001 Highlands Plaza Drive West, Suite 300 3WE-5M-F(0.2)-1113 GWE-5S-F(0.2)-1113 Sample Identification GWE-5S-1113 4 GWE-5D-1113 Phone GWE-3D-1113 GWE-5M-1113 FAX Project Name: 4Q13 LTM GW Sampling Client Contact Savannah, GA 31404 phone 912.354.7858 fax 912.352.0165 Site: Solutia WG Krummich Facility ossible Hazard Identification 5102 LaRoche Avenue St Louis, MO 63110 Non-Hazurd URS Corporation (314) 429-0100 (314) 429-0462 clinquished by: Relinquished by: Savannah # O d

### Login Sample Receipt Checklist

Client: Solutia Inc.

Job Number: 680-95983-1

SDG Number: KPS100

List Source: TestAmerica Savannah

Login Number: 95983 List Number: 1

Creator: Conner, Keaton

Question	Answer Comment	
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

### **Certification Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-95983-1

SDG: KPS100

### Laboratory: TestAmerica Savannah

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
	AFCEE		SAVLAB	
A2LA	DoD ELAP		399.01	02-28-15
A2LA	ISD/IEC 17025		399.01	02-28-15
Alabama	State Program	4	41450	06-30-14
Arkansas DEQ	State Program	6	88-0692	02-01-14
California	NELAP	9	3217CA	07-31-14
Colorado	State Program	8	N/A	12-31-13 *
Connecticut	State Program	1	PH-0161	03-31-15
Florida	NELAP	4	E87052	06-30-14
GA Dept. of Agriculture	State Program	4	N/A	12-31-13 *
Georgia	State Program	4	N/A	06-30-14
Georgia	State Program	4	803	06-30-14
Guam	State Program	9	09-005r	06-17-14
Hawaii	State Program	9	N/A	06-30-14
Illinois	NELAP	5	200022	11-30-13 *
Indiana	State Program	5	N/A	06-30-14
lowa	State Program	7	353	07-01-15
Kentucky	State Program	4	90084	12-31-13 *
Kentucky (UST)	State Program	4	18	06-30-14
Louisiana	NELAP	6	30690	06-30-14
Maine	State Program	1	GA00006	08-16-14
Maryland	State Program	3	250	12-31-13 *
Massachusetts	State Program	<b>'</b> 1	M-GA006	06-30-14
Michigan	State Program	5	9925	06-30-14
Mississippi	State Program	4	N/A	06-30-14
Montana	State Program	8	CERT0081	01-01-14 *
Nebraska	State Program	7	TestAmerica-Savannah	06-30-14
New Jersey	NELAP	2	GA769	06-30-14
New Mexico	State Program	6	N/A	06-30-14
New York	NELAP	2	10842	04-01-14
North Carolina DENR	State Program	4	269	12-31-13 *
North Carolina DHHS	State Program	4	13701	07-31-14
Oklahoma	State Program	6	9984	08-31-14
Pennsylvania	NELAP	3	68-00474	06-30-14
Puerto Rico	State Program	2	GA00006	01-01-14 *
South Carolina	State Program	4	98001	06-30-14
Tennessee		4	TN02961	06-30-14
	State Program			
Texas	NELAP Fodores	6	T104704185-08-TX SAV 3-04	11-30-14
USDA	Federal	2		04-07-14
Virginia	NELAP	3	460161	06-14-14
Washington	State Program	10	C1794	06-10-14
West Virginia	State Program	3	9950C	12-31-13 *
West Virginia DEP	State Program	3	94	06-30-14
Wisconsin	State Program	5	999819810	08-31-14
Wyoming	State Program	8	8TMS-L	06-30-14

. 6.9

<sup>\*</sup> Expired certification is currently pending renewal and is considered valid.

# Solutia Krummrich Data Review WGK LTM 4Q13

**Laboratory SDG: KPS101** 

Data Reviewer: Melissa Mansker Peer Reviewer: Elizabeth Kunkel

**Date Reviewed: 12/9/2013** 

Guidance: USEPA National Functional Guidelines for Superfund Organic Methods Data Review 2008. USEPA National Functional Guidelines for Superfund

**Inorganic Data Review 2010** 

Work Plan: Revised Long-Term Monitoring Program (LTMP) Work Plan (Solutia

2009)

Sample Identification		
ESL-MW-A-1113	ESL-MW-A-F(0.2)-1113	
ESL-MW-C1-1113	ESL-MW-C1-F(0.2)-1113	
ESL-MW-D1-1113	ESL-MW-D1-F(0.2)-1113	
4Q13 LTM Trip Blank #5		

### 1.0 Data Package Completeness

Were all items delivered as specified in the QAPP and COC as appropriate?

Υρς

### 2.0 Laboratory Case Narrative \ Cooler Receipt Form

Were problems noted in the laboratory case narrative or cooler receipt form?

Yes, the laboratory case narrative indicated the VOC LCS recovery was outside evaluation criteria for 1,2-dichlorobenzene. The nitrate MSD recovery was outside evaluation criteria for sample ESL-MW-A-1113. Samples were diluted due to high levels of target analytes. These issues are addressed further in the appropriate sections below.

The cooler receipt form did not indicate any problems.

#### 3.0 Holding Times

Were samples extracted/analyzed within applicable limits?

Yes

#### 4.0 Blank Contamination

Were any analytes detected in the Method Blanks, Field Blanks or Trip Blanks?

No

#### 5.0 Laboratory Control Sample

Were LCS recoveries within evaluation criteria?

No

LCS/LCSD ID	Parameter	Analyte	LCS/LCSD Recovery	RPD	LCS/LCSD/ RPD Criteria	
LCS/LCSD 680- 304581/4/5	VOCs	1,2- Dichlorobenzene	76/79	4	77-124/30	

Analytical data that required qualification based on LCS data are included in the table below.

Sample ID	Parameter	Analyte	Qualification		
ESL-MW-D1-1113	VOCs	1,2-Dichlorobenzene	UJ		

### 6.0 Surrogate Recoveries

Were surrogate recoveries within evaluation criteria?

Yes

#### 7.0 Matrix Spike and Matrix Spike Duplicate Recoveries

Were MS/MSD samples collected as part of this SDG?

Yes, although not requested, sample ESL-MW-A-1113 was analyzed for nitrate.

Were MS/MSD recoveries within evaluation criteria?

No

MS/MSD ID	Parameter	Analyte	MS/MSD Recovery	RPD	MS/MSD/ RPD Criteria	
ESL-MW-A-1113	General chemistry	Nitrate	110/ <b>111</b>	1	90-110/10	

Analytical data reported as non-detect and associated with MS/MSD recoveries above evaluation criteria, indicating a possible high bias, did not require qualification. No qualification of data was required.

#### 8.0 Internal Standard (IS) Recoveries

Were internal standard area recoveries within evaluation criteria?

Yes

#### 9.0 Laboratory Duplicate Results

Were laboratory duplicate samples collected as part of this SDG?

No

#### 10.0 Field Duplicate Results

Were field duplicate samples collected as part of this SDG?

No

# 10.0 Sample Dilutions

For samples that were diluted and nondetect, were undiluted results also reported? Not applicable; analytes were detected in samples that were diluted.

#### 11.0 Additional Qualifications

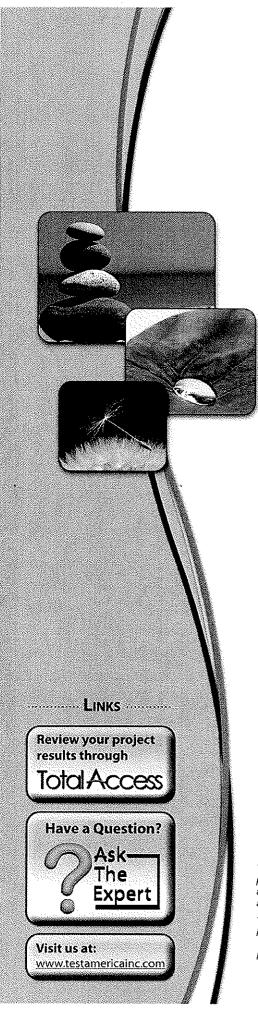
Were additional qualifications applied?

No

# **SDG KPS101**

Results of Samples from Monitoring Well:

ESL-MW-A ESL-MW-C1 ESL-MW-D1



# **TestAmerica**

THE LEADER IN ENVIRONMENTAL TESTING

# **ANALYTICAL REPORT**

TestAmerica Laboratories, Inc. TestAmerica Savannah 5102 LaRoche Avenue Savannah, GA 31404 Tel: (912)354-7858

TestAmerica Job ID: 680-96022-1
TestAmerica Sample Delivery Group: KPS101
Client Project/Site: WGK Long Term Monitoring - 4Q13 NOV
2013

For: Solutia Inc. 575 Maryville Centre Dr. Saint Louis, Missouri 63141

Attn: Mr. Jerry Rinaldi

Michele Kkirsey

Authorized for release by: 11/26/2013 2:58:38 PM

Michele Kersey, Project Manager I (912)354-7858 michele.kersey@testamericainc.com

Reviewed on DEC 09 2013 My

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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#### **Case Narrative**

Client: Solutia Inc.
Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-96022-1

SDG: KPS101

Job ID: 680-96022-1

Laboratory: TestAmerica Savannah

Narrative

#### **CASE NARRATIVE**

Client: Solutia Inc.

Project: WGK Long Term Monitoring - 4Q13 NOV 2013

Report Number: 680-96022-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

#### RECEIPT

The samples were received on 11/09/2013; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 3.2 C.

#### **VOLATILE ORGANIC COMPOUNDS (GC-MS)**

Samples ESL-MW-A-1113 (680-96022-1), ESL-MW-C1-1113 (680-96022-3), ESL-MW-D1-1113 (680-96022-5) and 4Q13 LTM Trip Blank #5 (680-96022-7) were analyzed for Volatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 11/20/2013 and 11/22/2013.

A full list spike was utilized for this method. Due to the large number of spiked analytes, there is a high probability that one or more analytes will recover outside acceptance limits. The laboratory's SOP allows for four analytes to recover outside criteria for this method when a full list spike is utilized. The LCS associated with batch 304581 had one analyte outside control limits; therefore, re-analysis was not performed. These results have been reported and qualified.

Sample ESL-MW-D1-1113 (680-96022-5)[25X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No other difficulties were encountered during the volatiles analysis.

All other quality control parameters were within the acceptance limits.

#### DISSOLVED GASES

Samples ESL-MW-A-1113 (680-96022-1), ESL-MW-C1-1113 (680-96022-3) and ESL-MW-D1-1113 (680-96022-5) were analyzed for dissolved gases in accordance with RSK-175. The samples were analyzed on 11/13/2013.

No difficulties were encountered during the dissolved gases analysis.

All quality control parameters were within the acceptance limits.

#### METALS (ICP)

Samples ESL-MW-A-F(0.2)-1113 (680-96022-2), ESL-MW-C1-F(0.2)-1113 (680-96022-4) and ESL-MW-D1-F(0.2)-1113 (680-96022-6) were analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 11/11/2013 and analyzed on 11/13/2013.

DEC 0 9 2013

#### **Case Narrative**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-96022-1

SDG: KPS101

#### Job ID: 680-96022-1 (Continued)

Laboratory: TestAmerica Savannah (Continued)

No difficulties were encountered during the metals analysis.

All quality control parameters were within the acceptance limits.

#### METALS (ICP)

Samples ESL-MW-A-1113 (680-96022-1), ESL-MW-C1-1113 (680-96022-3) and ESL-MW-D1-1113 (680-96022-5) were analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 11/11/2013 and analyzed on 11/13/2013.

No difficulties were encountered during the metals analysis.

All quality control parameters were within the acceptance limits.

#### ALKALINITY

Samples ESL-MW-A-1113 (680-96022-1), ESL-MW-C1-1113 (680-96022-3) and ESL-MW-D1-1113 (680-96022-5) were analyzed for alkalinity in accordance with EPA Method 310.1. The samples were analyzed on 11/18/2013.

No difficulties were encountered during the alkalinity analysis.

All quality control parameters were within the acceptance limits.

#### CHLORIDE

Samples ESL-MW-A-1113 (680-96022-1), ESL-MW-C1-1113 (680-96022-3) and ESL-MW-D1-1113 (680-96022-5) were analyzed for Chloride in accordance with EPA Method 325.2. The samples were analyzed on 11/13/2013.

Samples ESL-MW-C1-1113 (680-96022-3)[2X] and ESL-MW-D1-1113 (680-96022-5)[2X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the chloride analysis.

All quality control parameters were within the acceptance limits.

#### NITRATE-NITRITE AS NITROGEN

Samples ESL-MW-A-1113 (680-96022-1), ESL-MW-C1-1113 (680-96022-3) and ESL-MW-D1-1113 (680-96022-5) were analyzed for nitrate-nitrite as nitrogen in accordance with EPA Method 353.2. The samples were analyzed on 11/09/2013.

The matrix spike duplicate (MSD) recovery for batch 302467 were outside control limits. The associated laboratory control sample (LCS) recovery met acceptance criteria.

No other difficulties were encountered during the nitrate-nitrite analysis.

All other quality control parameters were within the acceptance limits.

#### SULFATE

Samples ESL-MW-A-1113 (680-96022-1), ESL-MW-C1-1113 (680-96022-3) and ESL-MW-D1-1113 (680-96022-5) were analyzed for sulfate in accordance with EPA Method 375.4. The samples were analyzed on 11/11/2013.

Samples ESL-MW-A-1113 (680-96022-1)[50X], ESL-MW-C1-1113 (680-96022-3)[50X] and ESL-MW-D1-1113 (680-96022-5)[50X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the sulfate analysis.

All quality control parameters were within the acceptance limits.

TOTAL ORGANIC CARBON

DEC 0 9 2013

#### **Case Narrative**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-96022-1

SDG: KPS101

#### Job ID: 680-96022-1 (Continued)

Laboratory: TestAmerica Savannah (Continued)

Samples ESL-MW-A-1113 (680-96022-1), ESL-MW-C1-1113 (680-96022-3) and ESL-MW-D1-1113 (680-96022-5) were analyzed for total organic carbon in accordance with EPA Method 415.1. The samples were analyzed on 11/16/2013.

No difficulties were encountered during the TOC analysis.

All quality control parameters were within the acceptance limits.

#### **DISSOLVED ORGANIC CARBON (DOC)**

Samples ESL-MW-A-F(0.2)-1113 (680-96022-2), ESL-MW-C1-F(0.2)-1113 (680-96022-4) and ESL-MW-D1-F(0.2)-1113 (680-96022-6) were analyzed for Dissolved Organic Carbon (DOC) in accordance with EPA Method 415.1. The samples were analyzed on 11/13/2013.

No difficulties were encountered during the DOC analysis.

All quality control parameters were within the acceptance limits.

DEC 0 9 2013

TestAmerica Savannah

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# **Sample Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-96022-1

SDG: KPS101

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-96022-1	ESL-MW-A-1113	Water	11/08/13 13:55	11/09/13 08:50
680-96022-2	ESL-MW-A-F(0.2)-1113	Water	11/08/13 13:55	11/09/13 08:50
680-96022-3	ESL-MW-C1-1113 /	Water	11/08/13 10:25	11/09/13 08:50
680-96022-4	ESL-MW-C1-F(0.2)-1113	Water	11/08/13 10:25	11/09/13 08:50
680-96022-5	ESL-MW-D1-1113 📌 🦯	Water	11/08/13 12:10	11/09/13 08:50
680-96022-6	ESL-MW-D1-F(0.2)-1113	Water	11/08/13 12:10	11/09/13 08:50
680-96022-7	4Q13 LTM Trip Blank #5	Water	11/08/13 00:00	11/09/13 08:50



DEC 0 8 8000

# **Method Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-96022-1

SDG: KPS101

Method	Method Description	Protocol	Laboratory
82608	Volatile Organic Compounds (GC/MS)	SW846	TAL SAV
RSK-175	Dissolved Gases (GC)	RSK	TAL SAV
6010C	Metals (ICP)	SW846	TAL SAV
310.1	Alkalinity	MCAWW	TAL SAV
325.2	Chloride	MCAWW	TAL SAV
353.2	Nitrogen, Nitrate-Nitrite	MCAWW	TAL SAV
375.4	Sulfate	MCAWW	TAL SAV
415.1	TOC	MCAWW	TAL SAV
415.1	DOC	MCAWW	TAL SAV

#### Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

RSK = Sample Prep And Calculations For Dissolved Gas Analysis in Water Samples Using A GC Headspace Equilibration Technique, RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Lab

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

DEC 0 9 2013
TestAmerica Savannah

# **Definitions/Glossary**

Client: Solutia Inc. TestAmerica Job ID: 680-96022-1 Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013 **SDG: KPS101** Qualifiers GC/MS VOA Qualifier Qualifier Description Ü Indicates the analyte was analyzed for but not detected LCS or LCSD exceeds the control limits GC VOA Qualifier Qualifier Description ΰ Indicates the analyte was analyzed for but not detected. Metals Qualifier Qualifier Description Indicates the analyte was analyzed for but not detected. **General Chemistry** Qualifier Description Qualifier ΰ Indicates the analyte was analyzed for but not detected. MS/MSD Recovery and/or RPD exceeds the control limits Glossary Abbreviation These commonly used abbreviations may or may not be present in this report. Listed under the "D" column to designate that the result is reported on a dry weight basis %R Percent Recovery CNF Contains no Free Liquid DER Duplicate error ratio (normalized absolute difference) Dil Fac Dilution Factor DL, RA, RE, IN Indicates a Dilution, Re-analysis, Re-extraction, or additional trittal metals/anion analysis of the sample DLC Decision level concentration MDA Minimum detectable activity EDL Estimated Detection Limit MDC Minimum detectable concentration MDL Method Detection Limit ML Minimum Level (Dioxin) NC Not Calculated ΝD Not detected at the reporting limit (or MDL or EDL if shown) PQL Practical Quantitation Limit QC Quality Control RER Relative error ratio RL Reporting Limit or Requested Limit (Radiochemistry) RPO Relative Percent Difference, a measure of the relative difference between two points

DEC 0 9 2013

TestAmerica Savannah

TEF

TEQ

Toxicity Equivalent Factor (Dioxin)

Toxicity Equivalent Quotient (Dioxin)

# **Detection Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-96022-1

Lab Sample ID: 680-96022-1

Lab Sample ID: 680-96022-2

Lab Sample ID: 680-96022-3

Lab Sample ID: 680-96022-4

Lab Sample ID: 680-96022-5

SDG: KPS101

#### Client Sample ID: ESL-MW-A-1113

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	8.3	***************************************	1.0		ug/L	1	_	8260B	Total/NA
Chlorobenzene	4.2		1.0		ug/L	1		8260B	Total/NA
1,4-Dichlorobenzene	2.6		1.0		ug/L	1		8260B	Total/NA
Methane	4.0		0.58		ug/L	1		RSK-175	Total/NA
Iron	16		0.050		mg/L	1		6010C	Total
									Recoverable
Manganese	0.46		0.010		mg/L	1		6010C	Total
									Recoverable
Chloride	97		1.0		mg/L	1		325.2	Total/NA
Sulfate	620		250		mg/L	50		375.4	Total/NA
Total Organic Carbon	3.1		1.0		mg/L	1		415.1	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Alkalinity	370	***************************************	5.0		mg/L	1		310.1	Tota!/NA
Carbon Dioxide, Free	32		5.0		mg/L	1		310.1	Total/NA

#### Client Sample ID: ESL-MW-A-F(0.2)-1113

Analyte	Result Q	Qualifier R	_ MDL	Unit	Dil Fac	D	Method	Ргер Туре
Iron, Dissolved	16	0.05	)	mg/L	1		6010C	Dissolved
Manganese, Dissolved	0.47	0.01	)	mg/L	1		6010C	Dissolved
Dissolved Organic Carbon	2.9	1.	ס	mg/L	1		415.1	Dissolved

#### Client Sample ID: ESL-MW-C1-1113

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	1.5		1.0		ug/L	1	_	8260B	Total/NA
1,4-Dichlorobenzene	1.4		1.0		ug/L	1		B260B	Total/NA
Methane	3.3		0.58		ug/L	1		RSK-175	Total/NA
iron	13		0.050		mg/L	1		6010C	Total
									Recoverable
Manganese	0.43		0.010		mg/L	1		6010C	Total
									Recoverable
Chloride	100		2.0		mg/L	2		325,2	Total/NA
Sulfate	760		250		mg/L	50		375.4	Total/NA
Total Organic Carbon	3.4		1.0		mg/L	1		415.1	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Ргер Туре
Alkalinity	390		5.0		mg/L	1		310.1	Total/NA
Carbon Dioxide, Free	3,4		5.0		mg/Ł	1		310.1	Total/NA

#### Client Sample ID: ESL-MW-C1-F(0.2)-1113

Analyte	Result	Qualifier	RL	MDL	Unit	Dìl Fac	D	Method	Ргер Туре
Iron, Dissolved	13		0.050	announced to the property of the latest	mg/L	1	_	6010C	 Dissolved
Manganese, Dissolved	0.44		0.010		mg/L	1		6010C	Dissolved
Dissolved Organic Carbon	3.5		1,0		mg/L	1		415.1	Dissolved

#### Client Sample ID: ESL-MW-D1-1113

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Ргер Туре
Benzene	45		25		ug/L	25	***	8260B	Total/NA
Chlorobenzene	1500		25		ug/L	25		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

DEC 0 9 2013

# **Detection Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-96022-1

Lab Sample ID: 680-96022-5

Lab Sample ID: 680-96022-7

SDG: KPS101

# Client Sample ID: ESL-MW-D1-1113 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dichlorobenzene	41		25		ug/L	25		8260B	Total/NA
Methane	44		0.58		ug/L	1		RSK-175	Total/NA
Iron	15		0.050		mg/L	1		6010C	Total
Manganese	0.40		0.010		mg/L	1		6010C	Recoverable Total Recoverable
Chloride	120		2.0		mg/L	2		325.2	Total/NA
Sulfate	570		250		mg/L	50		375.4	Total/NA
Total Organic Carbon	3.2		1.0		mg/L	1		415.1	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Alkalinity	380		5.0		mg/L	1		310.1	Total/NA
Carbon Dioxide, Free	36		5.0		mg/L	1		310.1	Total/NA

#### Client Sample ID: ESL-MW-D1-F(0.2)-1113

Client Sample ID: ESL-MW-D	Client Sample ID: ESL-MW-D1-F(0.2)-1113									
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Ргер Туре	
Iron, Dissolved	15		0.050		mg/L	1		6010C	Dissolved	
Manganese, Dissolved	0.41		0.010		mg/L	1		6010C	Dissolved	
Dissolved Organic Carbon	3.1		1,0		mg/L	1		415.1	Dissolved	

#### Client Sample ID: 4Q13 LTM Trip Blank #5

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Savannah

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-96022-1

SDG: KPS101

Client Sample ID: ESL-MW-A-1113

Date Collected: 11/08/13 13:55 Date Received: 11/09/13 08:50 Lab Sample ID: 680-96022-1

Matrix: Water

Method: 8260B - Volatile Or Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	8.3		1,0		ug/L			11/20/13 04:05	1
Chlorobenzene	4.2		1.0		ug/L			11/20/13 04:05	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			11/20/13 04:05	1
1.3-Dichlorobenzene	1.0		1,0		ug/L			11/20/13 04:05	1
1,4-Dichlorobenzene	2.6		1.0		ug/L			11/20/13 04:05	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	98		70 - 130					11/20/13 04:05	1
Dibromofluoromethane	113		70 - 130					11/20/13 04:05	1
Toluene-d8 (Surr)	99		70 - 130					11/20/13 04:05	1
Method: RSK-175 - Dissolve	ed Gases (GC)								
Analyte	Result	Qualifier	RL	MÐL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	1.1	Ū	1.1		ug/L			11/13/13 11:36	1
Ethylene	1.0	U	1.0		ug/L			11/13/13 11:36	1
Methane	4.0		0,58		ug/L			11/13/13 11:36	1
Method: 6010C - Metals (ICI	P) - Total Recoverat	ole							
Analyte		Qualifier	RL	MDL	Unit	Ð	Prepared	Analyzed	Dil Fac
Iron	16		0.050		mg/L		11/11/13 13:32	11/13/13 00:41	1
Manganese	, 0. <b>46</b>		,0.010		mg/L	•	11/11/13 13:32	11/13/13 00:41	, 1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	Ð	Prepared	Analyzed	Dil Fac
Chloride	97		1.0	~~~~~~	mg/L			11/13/13 13:35	1
	0,050	ឋ	0.050		mg/L			11/09/13 12:59	1
Nitrate as N			250		mg/L			11/11/13 16:31	50
	620							11/16/13 22:05	
Sulfate	620 3.1		1.0		mg/L			11/10/10 22:00	1
Sulfate Total Organic Carbon	3.1	Qualifier	1.0 RL	RL	Unit	D	Prepared	Analyzed	1 Dil Fac
Nitrate as N Sulfate Total Organic Carbon Analyte Alkalinity	3.1	Qualifier		RL	_	D	Prepared		

TestAmerica Savannah

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-96022-1

SDG: KPS101

Client Sample ID: ESL-MW-A-F(0.2)-1113

Date Collected: 11/08/13 13:55 Date Received: 11/09/13 08:50 Lab Sample ID: 680-96022-2

Matrix: Water

Method: 6010C - Metals (ICP) -								
Analyte	Result Qualifier	RL	MDL	Unit	ם	Prepared	Analyzed	Dil Fac
Iron, Dissolved	16	0.050		mg/L		11/11/13 13:32	11/13/13 00:45	1
Manganese, Dissolved	0.47	0.010		mg/L		11/11/13 13:32	11/13/13 00:45	1
\$****								

General Chemistry - Dissolved									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	2.9		1.0		mg/L			11/13/13 20:50	1

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Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-96022-1

SDG: KPS101

Client Sample ID: ESL-MW-C1-1113

Date Collected: 11/08/13 10:25 Date Received: 11/09/13 08:50 Lab Sample ID: 680-96022-3

Matrix: Water

Method: 8260B - Volatile Or Analyte	•	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.5		1.0		ug/L		Evaluation to an extra contra	11/20/13 04:34	1
Chlorobenzene	1.0	U	1.0		ug/L			11/20/13 04:34	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			11/20/13 04:34	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			11/20/13 04:34	1
1,4-Dichlorobenzene	1.4		1.0		ug/L			11/20/13 04:34	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenz <b>en</b> e	98		70 - 130					11/20/13 04:34	7
Dibromofluoromethane	108		70 - 130					11/20/13 04:34	1
Toluene-d8 (Surr)	100		70 - 130					11/20/13 04:34	1
Method: RSK-175 - Dissolve	ed Gases (GC)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	1.1	U	1.1		ug/L			11/13/13 11:49	1
Ethylene	1.0	U	1.0		ug/L			11/13/13 11:49	1
Methane	3.3		0.58		ug/L			11/13/13 11:49	1
Method: 6010C - Metals (ICI	P) - Total Recoverat	ole							
Analyte		Qualifier	RL	MDL	Unit	Đ	Prepared	Analyzed	Díl Fac
Iron	13		0.050		mg/L		11/11/13 13:32	11/13/13 00:50	1
Manganese	0.43		0.010		mg/L		11/11/13 13:32	11/13/13 00:50	1
General Chemistry									
Analyle	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	100	**************************************	2.0		mg/Ł		11. Carlot 1 Provide Local Construction and State Construction	11/13/13 15:04	2
Nitrate as N	0.050	U	0.050		mg/L			11/09/13 13:03	1
Sulfate	760		250		mg/L			11/11/13 16:29	50
t-4-1 01- 0t	3.4		1,0		mg/L			11/16/13 22:21	1
lotal Organic Carbon	D	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
· ·	Result								
Total Organic Carbon Analyte Alkalinity	390	**************************************	5.0	harde the best has a stranger to the section of the	mg/L			11/18/13 13:17	1

TestAmerica Savannah

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-96022-1

SDG: KPS101

Client Sample ID: ESL-MW-C1-F(0.2)-1113

Date Collected: 11/08/13 10:25 Date Received: 11/09/13 08:50 Lab Sample ID: 680-96022-4

Matrix: Water

Method: 6010C - Metals (ICP) - Diss	olved								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Oil Fac
Iron, Dissolved	13		0.050		mg/L		11/11/13 13:32	11/13/13 01:04	1
Manganese, Dissolved	0.44		0.010		mg/L		11/11/13 13:32	11/13/13 01:04	1

General Chemistry - Dissolved									
Analyte	Result Qu	ualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	3.5		1.0	h	mg/L	_		11/13/13 21:10	<del></del> 1

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Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-96022-1

SDG: KPS101

Client Sample ID: ESL-MW-D1-1113

Date Collected: 11/08/13 12:10 Date Received: 11/09/13 08:50 Lab Sample ID: 680-96022-5

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	45		25	·····	ug/L			11/22/13 12:36	25
Chlorobenzene	1500		25		ug/L			11/22/13 12:36	25
1,2-Dichlorobenzene	25	U. UJ	25		ug/L			11/22/13 12:36	25
1,3-Dichlorobenzene	25		25		ug/L			11/22/13 12:36	25
1,4-Dichlorobenzene	41		25		ug/L			11/22/13 12:36	25
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fa
4-Bromofluorobenzene	99		70 - 130					11/22/13 12:36	25
Dibromofluoromethane	107		70 - 130					11/22/13 12:36	2
Toluene-d8 (Surr)	100		70 - 130					11/22/13 12:36	25
Method: RSK-175 - Dissolve	ed Gases (GC)								
Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	1.1	U	1.1		ug/L	*********	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	11/13/13 12:02	*
Ethylene	1.0	U	1.0		ug/L			11/13/13 12:02	
Methane	44		0,58		ug/L			11/13/13 12:02	•
Method: 6010C - Metals (ICI	P) - Total Recoverat	ole							
Analyte	•	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	15		0.050		mg/L		11/11/13 13:32	11/13/13 01:09	
Manganese	0.40	•	0.010		mg/L ,		11/11/13 13:32	11/13/13 01:09	1
•									
General Chemistry				MEN	Unit	D	Prepared	Analyzed	Dil Fac
•	Result	Qualifier	RL	MUL					Unra
Analyte	Result 120	Qualifier	2,0	MUL	mg/L			11/13/13 15:04	***************************************
Analyte Chloride		BANKA BOOM CATORS FOR DE TOURSERA	##************************************	MUL	mg/L mg/L			11/13/13 15:04 11/09/13 13:04	OII F AC
Analyte Chloride Nitrate as N	120	BANKA BOOM CATORS FOR DE TOURSERA	2,0	MUL	-		The second secon		***************************************
Analyte Chloride Nitrate as N Sulfate	<b>120</b> 0.050	BANKA BOOM CATORS FOR DE TOURSERA	2,0 0.050	MUL	mg/L			11/09/13 13:04	5
Analyte Chloride Nitrate as N Sulfate Total Organic Carbon	120 0.050 570 3.2	BANKA BOOM CATORS FOR DE TOURSERA	2,0 0.050 250	***************************************	mg/L mg/L	D	Prepared	11/09/13 13:04 11/11/13 16:29	***************************************
General Chemistry Analyte Chloride Nitrate as N Sulfate Total Organic Carbon Analyte	120 0.050 570 3.2	U	2.0 0.050 250 1.0	***************************************	mg/L mg/L mg/L	D	Prepared	11/09/13 13:04 11/11/13 16:29 11/16/13 22:36	5

TestAmerica Savannah

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-96022-1

SDG: KPS101

Client Sample ID: ESL-MW-D1-F(0.2)-1113

Date Collected: 11/08/13 12:10 Date Received: 11/09/13 08:50 Lab Sample ID: 680-96022-6

Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

method: 00100 " metala (101 / " Dia	JOITCU								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	15	han b m/b bank and baba/and bank/b/1/7/7	0.050		mg/L	~-	11/11/13 13:32	11/13/13 01:13	1
Manganese, Dissolved	0.41		0.010		mg/L		11/11/13 13:32	11/13/13 01:13	1

:										
:										
	General Chemistry - Dissolved									
	Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Dissolved Organic Carbon	3.1	***************************************	1,0		mg/L			11/13/13 21:29	1

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Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-96022-1

SDG: KPS101

Client Sample ID: 4Q13 LTM Trip Blank #5

Date Collected: 11/08/13 00:00 Date Received: 11/09/13 08:50 Lab Sample ID: 680-96022-7

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)											
Analyte	Result	Qualifier	RL	MDL	Unit		D	Prepared	Analyzed	Dil Fac	
Benzene	1.0	U	1,0	P14 F000 1000 1000 1000 1000 1000 1000 10	ug/L				11/20/13 01:08	***************************************	
Chlorobenzene	1.0	U	1.0		ug/L				11/20/13 01:08	1	
1,2-Dichlorobenzene	1.0	U	1.0		ug/L				11/20/13 01:08	1	
1,3-Dichlorobenzene	1.0	U	1,0		ug/L				11/20/13 01:08	1	
1,4-Dichlorobenzeле	1.0	U	1.0		ug/L				11/20/13 01:08	1	

	Surrogate	%Recovery	Qualifier	Limits	Prepared Analyzed	Dil Fac
	4-Bromofluorobenzene	97		70 - 130	11/20/13 01:08	1
	Dibromofluoromethane	111		70 - 130	11/20/13 01:08	1
1	Toluene-d8 (Surr)	99		70 - 130	11/20/13 01:08	1

# **Surrogate Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-96022-1

SDG: KPS101

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water Prep Type: Total/NA

				Percent Surrog	ate Recovery (Acceptance Limits
		BFB	DBFM	TOL	
ab Sample ID	Client Sample ID	(70-130)	(70-130)	(70-130)	
80-96022-1	ESL-MW-A-1113	98	113	99	
80-96022-3	ESL-MW-C1-1113	98	108	100	
880-96022-5	ESL-MW-D1-1113	99	107	100	
80-96022-7	4Q13 LTM Trip Blank #5	97	111	99	
CS 680-304108/4	Lab Control Sample	96	104	104	
CS 680-304581/4	Lab Control Sample	81	106	99	
CSD 680-304108/5	Lab Control Sample Dup	101	99	104	
CSD 680-304581/5	Lab Control Sample Dup	84	109	97	
1B 680-304108/8	Method Blank	97	109	100	
AB 680-304581/9	Method Blank	99	107	97	

Surrogate Legend

BFB = 4-Bromofluorobenzene

DBFM = Dibromofluoromethane

TOL = Toluene-d8 (Surr)

TestAmerica Savannah

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-96022-1

SDG: KPS101

#### Method: 8260B - Volatile Organic Compounds (GC/MS)

Client Sample ID: Method Blank Lab Sample ID: MB 680-304108/8 Matrix: Water

Prep Type: Total/NA Analysis Batch: 304108

		MB	MB							
1	Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Benzene	1.0	U	1.0		ug/L		~~~~~	11/20/13 00:09	1
	Chlorobenzene	1.0	υ	1.0		ug/L			11/20/13 00:09	1
-	1,2-Dichlorobenzene	1.0	U	1.0		ug/L			11/20/13 00:09	1
	1,3-Dichlorobenzene	1.0	U	1.0		ug/L			11/20/13 00:09	1
	1,4-Dichlorobenzene	1.0	U	1.0		ug/L			11/20/13 00:09	1
		мв	MB							
	Surrogate	%Recovery	Qualifier	Limits			•	Prepared	Analyzed	Dil Fac

4-Bromofluorobenzene 70 - 130 11/20/13 00:09 11/20/13 00:09 Dibromofluoromethane 70 - 130 109 11/20/13 00:09 70 - 130 Toluene-d8 (Surr) 100

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ab Sample ID: LCS 680-304108/4			Client Sample ID: Lab Control Sample
latrix: Water			Prep Type: Total/NA
nalysis Batch: 304108			
	. Spike	LCS LCS	%Rec.

Spike LCS LCS Analyte Added Result Qualifier Unit %Rec Limits 50.0 53,1 106 74 - 123 Benzene ug/L 50.0 51.4 ug/L 103 79 - 120 Chlorobenzene ug/L 106 77 - 124 1,2-Dichlorobenzene 50.0 53.2 104 79 - 123 1,3-Dichlorobenzene 50.0 52.1 ug/L 50.0 51.4 ug/L 103 76 - 124 1,4-Dichlorobenzene

LCS LCS Limits Surrogate %Recovery Qualifier 70 - 130 4-Bromofluorobenzene 96 Dibromofluoromethane 104 70 - 130 Toluene-d8 (Surr) 104 70 - 130

Client Sample ID: Lab Control Sample Dup Lab Sample ID: LCSD 680-304108/5 Prep Type: Total/NA Matrix: Water

Analysis Batch: 304108

	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Benzene .	50.0	52.0		ug/L		104	74 - 123	2	30
Chiorobenzene	50.0	52.3		ug/L		105	79 . 120	2	30
1,2-Dichtorobenzene	50.0	52.5		ug/L		105	77 - 124	1	30
1,3-Dichtorobenzene	50.0	52.5		ug/L		105	79 - 123	1	30
1,4-Dichlorobenzene	50.0	52.9		ug/L		106	76 - 124	3	30

LCSD LCSD Surrogate %Recovery Limits Qualitier 70 - 130 4-Bromofluorobenzene 101 70 . 130 Dibromofluoromethane 99 Toluene-d8 (Sum) 104 70 - 130

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-96022-1

SDG: KPS101

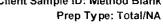
#### Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-304581/9

Matrix: Water

Analysis Batch: 304581

Client Sam	ple ID:	Method	Blank
	Pren 1	Ty ne <sup>.</sup> To	tal/NA



	"""			the state of the s				
Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	Ū	1.0	ug/L	— —		11/22/13 12:14	1
Chlorobenzene	1.0	U	1.0	ug/L			11/22/13 12:14	1
1,2-Dichlorobenzene	1.0	U	1.0	ug/L			11/22/13 12:14	1
1,3-Dichlorobenzene	1.0	U	1.0	ug/L			11/22/13 12:14	1
1,4-Dichlorobenzene	1.0	U	1.0	ug/L			11/22/13 12:14	1
	440	440						
	Benzene Chlorobenzene 1,2-Dichlorobenzene 1,3-Dichlorobenzene	Analyte         Result           Benzene         1.0           Chlorobenzene         1.0           1,2-Dichlorobenzene         1.0           1,3-Dichlorobenzene         1.0           1,4-Dichlorobenzene         1.0	Benzene         1.0 U           Chlorobenzene         1.0 U           1,2-Dichlorobenzene         1.0 U           1,3-Dichlorobenzene         1.0 U           1,4-Dichlorobenzene         1.0 U	Analyte         Result Denzeror         Qualifier         RL           Benzene         1.0         U         1.0           Chlorobenzene         1.0         U         1.0           1,2-Dichlorobenzene         1.0         U         1.0           1,3-Dichlorobenzene         1.0         U         1.0	Analyte         Result Dualifier         RL         MDL         Unit           Benzene         1.0 U         1.0 ug/L           Chlorobenzene         1.0 U         1.0 ug/L           1,2-Dichlorobenzene         1.0 U         1.0 ug/L           1,3-Dichlorobenzene         1.0 U         1.0 ug/L           1,4-Dichlorobenzene         1.0 U         1.0 ug/L	Analyte         Result         Qualifier         RL         MDL         Unit         D           Benzene         1.0         U         1.0         ug/L           Chlorobenzene         1.0         U         1.0         ug/L           1,2-Dichlorobenzene         1.0         U         1.0         ug/L           1,3-Dichlorobenzene         1.0         U         1.0         ug/L           1,4-Dichlorobenzene         1.0         U         1.0         ug/L	Analyte         Result         Qualifier         RL         MDL         Unit         D         Prepared           Benzene         1.0         U         1.0         ug/L           Chlorobenzene         1.0         U         1.0         ug/L           1,2-Dichlorobenzene         1.0         U         1.0         ug/L           1,3-Dichlorobenzene         1.0         U         1.0         ug/L           1,4-Dichlorobenzene         1.0         U         1.0         ug/L	Analyte         Result Qualifier         RL         MDL Unit         D         Prepared         Analyzed           Benzene         1.0 U         1.0 ug/L         11/22/13 12:14           Chlorobenzene         1.0 U         1.0 ug/L         11/22/13 12:14           1,2-Dichlorobenzene         1.0 U         1.0 ug/L         11/22/13 12:14           1,3-Dichlorobenzene         1.0 U         1.0 ug/L         11/22/13 12:14           1,4-Dichlorobenzene         1.0 U         1.0 ug/L         11/22/13 12:14

	M	3 MB					- 3
Surrogate	%Recover	y Qualifier	Limits	Prepared	Analyzed	Dil Fac	2000
4-Bromofluorobei	nzene 9	9	70 - 130	1	1/22/13 12:14	1	Control of
Dibromofluorome	thane 10	7	70 - 130	1	1/22/13 12:14	1	1
Toluene-d8 (Surr	9	7	70 - 130	1	1/22/13 12:14	1	

Lab Sample ID: LCS 680-304581/4

Matrix: Water

Analysis Batch: 304581

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	Đ	%Rec	Limits	
Benzene	50.0	47.1		ug/L		94	74 - 123	
Chlorobenzene	50.0	51.6		ug/L		103	79 - 120	
1,2-Dichlorobenzene	50.0	98,0	•	ug/L		(76)	77 - 124	
1,3-Dichlorobenzene	50.0	40,6		ug/L		81	79 - 123	
1,4-Dichlorobenzene	50.0	39,6		ug/L		79	76 - 124	

	LCS LCS					
Surrogate	%Recovery	Qualifier	Limits			
4-Bromofluorobenzene	81		70 - 130			
Dibromofluoromethane	106		70 - 130			
Toluene-d8 (Surr)	99		70 - 130			

Lab Sample ID: LCSD 680-304581/5

Matrix: Water

Analysis Batch: 304581

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Benzene .	50,0	46.6		ug/L		93	74 - 123	1	30
Chlorobenzene	50.0	54.4		ug/L		109	79 - 120	5	30
1,2-Dichlorobenzene	50.0	39.6		ug/L		79	77 - 124	4	30
1,3-Dichlorobenzene	50.0	41.3		ug/L		83	79 - 123	2	30
1,4-Dichlorobenzene	50.0	40.6		ug/L		81	76 - 124	2	30
· '				-			· <del>-</del>	2 2	-

	LCSD		
Surrogate	%Recovery		Limits
4-Bromofluorobenzene	84		70 - 130
Dibromofluorometh <b>a</b> ne	109		70 - 130
Toluene-d8 (Surr)	97		70 - 130

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-96022-1

SDG: KPS101

Method: RSK-175 - Dissolved Gases (GC)

Lab Sample ID: MB 680-302929/3

Matrix: Water

Client Sample ID: Method Blank Prep Type: Total/NA

Analysis Batch: 302929

	WID	mb							
Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	1.1	U	1.1		ug/L	 		11/13/13 09:29	1
Ethylene	1.0	U	1.0		ug/L			11/13/13 09:29	1
Methane	0.58	U	0.58		ug/L			11/13/13 09:29	1

MD MD

Lab Sample ID: LCS 680-302929/5

Matrix: Water

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analysis Batch: 302929

1		Spike	LCS	LCS				%Rec.		
	Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits		
	Ethane	288	287		ug/L	****	100	75 - 125	***************************************	
- Constitution	Ethylene	269	268		ug/L		99	75 <sub>-</sub> 125		
	Methane	154	145		ug/L		94	75 - 125		

Lab Sample ID: LCSD 680-302929/8

Matrix: Water

Analysis Batch: 302929

Client Sample ID: Lab	Control Sample Dup
	Prep Type: Total/NA

1			Spike	LCSD	LCSD				%Rec.		RPD	
-	Analyte		Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit	
i	Ethane		288	242		ug/L		84	75 - 125	17	30	
	Ethylene	•	269	` 227		ug/L		` 84	75 - 125	16	30 ,	
	Methane		154	123		ug/L		80	75 - 125	16	30	
ŧ,												

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-302642/1-A

Matrix: Water

Analysis Batch: 303006

Client Sample ID: Method	Blank
Prep Type: Total Recove	erable

Prep Batch: 302642

	MB	MB							
Analyte	Result	Qualifier	RL	MDL I	Unit	D	Prepared	Analyzed	Dil Fac
Iron	0.050	U	0.050		mg/L		11/11/13 13:32	11/12/13 23:18	1
Iron, Dissolved	0.050	U	0.050	ı	mg/L		11/11/13 13:32	11/12/13 23:18	1
Manganese	0.010	U	0.010	1	mg/L		11/11/13 13:32	11/12/13 23:18	1
Manganese, Dissolved	0.010	U	0.010	ı	mg/L		11/11/13 13:32	11/12/13 23:18	1

Lab Sample ID: LCS 680-302642/2-A

Matrix: Water

Analysis Batch: 303006

Client Sample ID: Lab Control Sample Prep Type: Total Recoverable

Prep Batch: 302642

; Allalysis Datell, 303000							ı ı <del>c</del> b	Datell. JVZ04Z
	Spike	LCS	LCS	4			%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Iron	5.00	5.33		mg/L	****	107	75 - 125	HILLENSON WITHOUT THE
Iron, Dissolved	5.00	5.33		mg/L		107	75 - 125	
Manganese	0.500	0.503		mg/L		101	75 - 125	
Manganese, Dissolved	0.500	0.503		mg/L		101	75 - 125	

lient: Solutia Inc.			, Samp							T	estAme	rica Job ID: 6	80-96	6022-1
roject/Site: WGK Long Term Monitoring	- 4Q13 N	OV 2013												PS10
ethod: 310.1 - Alkalinity														
Lab Sample ID: MB 680-303855/5		,			.,					(	Client S	ample ID: Me	thod	Blan
Matrix: Water												Prep Typ		
Analysis Batch: 303855													-,	•
maryoto patem occorr	МВ	мв												
Analyte	Result	Qualifier		RL		RL	Unit		D	Pro	pared	Analyzed		Dil Fa
Alkatinity	5.0	Ū		5.0			mg/L			***********		11/18/13 11:	46	
Carbon Dioxide, Free	5.0	U		5,0			mg/L					11/18/13 11:	46	
Lab Sample ID: LCS 680-303855/6									Cli	ent :	Sample	ID: Lab Con	trol S	amp
Matrix: Water												Prep Typ	e: To	tal/N
Analysis Batch: 303855														
			Spike			LCS						%Rec.		
Analyte			Added		Result	Qual	ifier	Unit		D	%Rec	Limits		
Alkalinity			250		211			mg/L			84	80 - 120		
Lab Sample ID: LCSD 680-303855/32								С	lient S	Samp	ple ID: I	Lab Control S	-	
Matrix: Water												Ргер Тур	e: To	tal/N
Analysis Batch: 303855														
			Spike		LCSD					_		%Rec.		RI
Analyte Alkalinity			Added 250		Result 225	Qual	ilier	Unit mg/L		D — -	%Rec	Limits 80 - 120	RPD 7	Lin
·								J						
lethod: 325.2 - Chloride														
Lab Sample ID: MB 680-303120/47				•						٠ (	Client S	Sample ID: Me	ethod	Blan
Matrix: Water												Ргер Тур	e: To	tal/N
Analysis Batch: 303120														
	MB	MB												
Analyte	Result	Qualifier		RL		MDL	Unit		D	Pn	epared	Analyzed		Dil F
Chloride	1.0	Ü		1.0			mg/L					11/13/13 15	:15	
Lab Sample ID: LCS 680-303120/6									Cli	ient	Sample	D: Lab Con	trol S	amp
Matrix: Water												Prep Typ	e: To	tal/N
Analysis Batch: 303120														
			Spike			LCS						%Rec.		
Analyte			Added		Result	Qua	lifier	Unit		D -	%Rec	Limits		
Chloride			50.0		50.0			mg/L			100	85 - 115		
Lab Sample ID: MB 680-303121/42										(	Client 9	Sample ID: Me		
Matrix: Water												Prep Typ	e: To	tal/N
Analysis Batch: 303121	MR	MB												
Analyte		Qualifier		RL		MDL	Unit		D	Pr	epared	Analyzed		Dil F
Chloride	1,0	10 /4 T / T / T / T / T / T / T / T / T /	V9-0-	1.0			mg/L			***********		11/13/13 15		P-17-11-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-
Lab Sample ID: LCS 680-303121/7									Cit	ient	Sample	e ID: Lab Con	trol 9	Samn
Matrix: Water									CI.	CIIL	vanipit	اD. Lab Con Prep Typ		
Analysis Batch: 303121												i ich i Al	10	, (41/14
may one Batom Over El			Spike		LCS	LCS						%Rec.		
			•											

TestAmerica Savannah

%Rec

100

Limits

85 - 115

DEC 0 0 20

Added

50.0

Result Qualifier

50.1

Unit

mg/L

Analyte

Chloride

Client: Solutia In-	C.
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Project/Site: WGK Long Term Monitoring ~ 4Q13 NOV 2013

TestAmerica Job ID: 680-96022-1

SDG: KPS101

Method: 353.2 - Nitrogen, Nitrate-Nitrite

Lab Sample ID: MB 680-302467/13

Matrix: Water

Analysis Batch: 302467

Client Sample ID: Method Blank Prep Type: Total/NA

мв мв

Analyte Result Qualifier MDL Unit Prepared Analyzed Dil Fac Nitrate as N 0.050 Ü 0.050 11/09/13 12:57 mq/L

Lab Sample ID: LCS 680-302467/14 Client Sample ID: Lab Control Sample Matrix: Water Prep Type: Total/NA

Analysis Batch: 302467

%Rec. Spike LCS LCS Analyte Added Result Qualifier Unit %Rec Limits Nitrate as N 0.497 0.546 mg/L 110 90 - 110 Nitrate Nitrite as N 0.997 1.05 105 90.110 mg/L Nitrite as N 0.500 0.504 101 90 . 110 mg/L

Lab Sample ID: 680-96022-1 MS Client Sample ID: ESL-MW-A-1113 Prep Type: Total/NA

Matrix: Water

Analysis Batch: 302467

The state of the		Sample	Sample	Spike	MS	MS				%Rec.	
**********	Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	
	Nitrate as N	0.050	U	0.497	0.545		mg/L		110	90 - 110	 ······
4	Nitrate Nitrite as N	0.050		0.997	1.05		mg/L		105	90 - 110	
1	Nitrite as N	0.050		0,500	0,505		mg/L		101	90 - 110	

Lab Sample ID: 680-96022-1 MSD Client Sample ID: ESL-MW-A-1113

Matrix: Water

Analysis Batch: 302467

-	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Nitrate as N	0.050	U	0.497	0.549	F	mg/L	F117.5	(111)	90 - 110	1	10
Nitrate Nitrite as N	0.050		0.997	1.06		mg/L		106	90 - 110	1	10
Nitrite as N	0.050		0.500	0.508		mg/L		102	90 - 110	1	10

Method: 375.4 - Sulfate

Lab Sample ID: MB 680-302727/19 Client Sample ID: Method Blank

Matrix: Water

Analysis Batch: 302727

Analyte Result Qualifier RL MDL Unit Prepared Analyzed Dil Fac Sulfate 5.0 U 5.0 11/11/13 16:27 mg/L

Lab Sample ID: LCS 680-302727/18 Client Sample ID: Lab Control Sample Matrix: Water Prep Type: Total/NA

Analysis Batch: 302727

LCS LCS Spike %Rec. Analyte Added Result Qualifier Unit %Rec Limits Sulfate 20.0 20.1 mg/L 100 75 - 125

TestAmerica Savannah

Prep Type: Total/NA

Prep Type: Total/NA

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-96022-1

SDG: KPS101

Method: 415.1 - DOC

Lab Sample ID: MB 680-303261/6

Matrix: Water

Analysis Batch: 303261

Dissolved Organic Carbon

MB MB

1.0 U

Result Qualifier

RL 1.0 MDL Unit mg/L

Prepared

Analyzed 11/13/13 14:43

Client Sample ID: Method Blank

Prep Type: Dissolved

Prep Type: Dissolved

Prep Type: Total/NA

Lab Sample ID: LCS 680-303261/5

Matrix: Water

Analysis Batch: 303261

Analyte Dissolved Organic Carbon

Spike Added 20,0

Spike

Added

20.0

LCS LCS Result Qualifier 17.3

Unit mg/L %Rec 86

%Rec. Limits 80 - 120

Client Sample ID: Lab Control Sample

Method: 415.1 - TOC

Lab Sample ID: MB 680-303829/26

Matrix: Water

Analysis Batch: 303829

Analyte Result Qualifier Total Organic Carbon 1.0 U

Lab Sample ID: LCS 680-303829/29

Matrix: Water

Analysis Batch: 303829

Analyte Total Organic Carbon

MB MB

1.0

MDL Unit mg/L

Unit

mg/L

LCS LCS

20.8

Result Qualifier

Prepared

D

Analyzed 11/16/13 17:13

Client Sample ID: Method Blank

Dil Fac

Client Sample ID: Lab Control Sample Prep Type: Total/NA

%Rec. %Rec Limits 104 80 - 120

# **QC Association Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-96022-1

SDG: KPS101

#### GC/MS VOA

-	Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
	680-96022-1	ESL-MW-A-1113	Total/NA	Water	8260B	
	680-96022-3	ESL-MW-C1-1113	Total/NA	Water	8260B	
	680-96022-7	4Q13 LTM Trip Blank #5	Total/NA	Water	8260B	
	LCS 680-304108/4	Lab Control Sample	Total/NA	Water	8260B	
-	LCSD 680-304108/5	Lab Control Sample Dup	Total/NA	Water	8260B	
-	MB 680-304108/8	Method Blank	Total/NA	Water	8260B	

#### Analysis Batch: 304581

	Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
	680-96022-5	ESL-MW-D1-1113	Total/NA	Water	8260B	***************************************
	LCS 680-304581/4	Lab Control Sample	Total/NA	Water	8260B	
	LCSD 680-304581/5	Lab Control Sample Dup	Total/NA	Water	8260B	
Act of the	MB 680-304581/9	Method Blank	Total/NA	Water	8260B	
1.						

#### **GC VOA**

#### Analysis Batch: 302929

Client Sample ID		Ргер Туре	Matrix	Method	Prep Batch
ESL-MW-A-1113	······································	Total/NA	Water	RSK-175	
ESL-MW-C1-1113		Total/NA	Water	RSK-175	
ESL-MW-D1-1113		Total/NA	Water	RSK-175	
Làb Control Sample	•	Total/NA	Water	RSK-175	•
Lab Control Sample Dup		Total/NA	Water	RSK-175	
Method Blank		Total/NA	Water	RSK-175	
	ESL-MW-A-1113 ESL-MW-C1-1113 ESL-MW-D1-1113 Làb Control Sample Lab Control Sample	ESL-MW-A-1113 ESL-MW-C1-1113 ESL-MW-D1-1113 Làb Control Sample Lab Control Sample Dup	ESL-MW-A-1113 Total/NA ESL-MW-C1-1113 Total/NA ESL-MW-D1-1113 Total/NA Làb Control Sample Total/NA Lab Control Sample Dup Total/NA	ESL-MW-A-1113 Total/NA Water ESL-MW-C1-1113 Total/NA Water ESL-MW-D1-1113 Total/NA Water Làb Control Sample Total/NA Water Lab Control Sample Dup Total/NA Water	ESL-MW-A-1113         Total/NA         Water         RSK-175           ESL-MW-C1-1113         Total/NA         Water         RSK-175           ESL-MW-D1-1113         Total/NA         Water         RSK-175           Làb Control Sample         Total/NA         Water         RSK-175           Lab Control Sample Dup         Total/NA         Water         RSK-175

#### Metals

#### Prep Batch: 302642

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-96022-1	ESL-MW-A-1113	Total Recoverable	Water	3005A	
680-96022-2	ESL-MW-A-F(0.2)-1113	Dissolved	Water	3005A	
680-96022-3	ESL-MW-C1-1113	Total Recoverable	Water	3005A	
680-96022-4	ESL-MW-C1-F(0.2)-1113	Dissolved	Water	3005A	
680-96022-5	ESL-MW-D1-1113	Total Recoverable	Water	3005A	
680-96022-6	ESL-MW-D1-F(0.2)-1113	Dissolved	Water	3005A	
LCS 680-302642/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
MB 680-302642/1-A	Method Blank	Total Recoverable	Water	3005A	

#### Analysis Batch: 303006

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-96022-1	ESL-MW-A-1113	Total Recoverable	Water	6010C	302642
680-96022-2	ESL-MW-A-F(0.2)-1113	Dissolved	Water	6010C	302642
680-96022-3	ESL-MW-C1-1113	Total Recoverable	Water	6010C	302642
680-96022-4	ESL-MW-C1-F(0.2)-1113	Dissolved	Water	6010C	302642
680-96022-5	ESL-MW-D1-1113	Total Recoverable	Water	6010C	302642
680-96022-6	ESL-MW-D1-F(0.2)-1113	Dissolved	Water	6010C	302642
LCS 680-302642/2-A	Lab Control Sample	Total Recoverable	Water	6010C	302642
MB 680-302642/1-A	Method Blank	Total Recoverable	Water	6010C	302642

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DEC @ 9 2013

# **QC Association Summary**

Client: Solutia Inc.

LCS 680-303855/6

Lab Control Sample

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-96022-1

SDG: KPS101

Inalysis Batch: 30246	7				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batcl
680-96022-1	ESL-MW-A-1113	Total/NA	Water	353,2	
680-96022-1 MS	ESL-MW-A-1113	Total/NA	Water	353.2	
680-96022-1 MSD	ESL-MW-A-1113	Total/NA	Water	353.2	
680-96022-3	ESL-MW-C1-1113	Total/NA	Water	353.2	
680-96022-5	ESL-MW-D1-1113	Total/NA	Water	353.2	
LCS 680-302467/14	Lab Control Sample	Total/NA	Water	353.2	
MB 680-302467/13	Method Blank	Total/NA	Water	353.2	
nalysis Batch: 30272	7				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Bato
680-96022-1	ESL-MW-A-1113	Total/NA	Water	375.4	···· -
680-96022-3	ESL-MW-C1-1113	Total/NA	Water	375.4	
680-96022-5	ESL-MW-D1-1113	Total/NA	Water	375.4	
LC\$ 680-302727/18	Lab Control Sample	Total/NA	Water	375.4	
MB 680-302727/19	Method Blank	Total/NA	Water	375.4	
nalysis Batch: 30312	0				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Bato
580-96022-1	ESL-MW-A-1113	Total/NA	Water	325.2	
580-96022-3	ESL-MW-C1-1113	Total/NA	Water	325.2	
LCS 680-303120/6	Lab Control Sample	Total/NA	Water	325.2	
MB 680-303120/47	· Method Blank	Total/NA	Water	325.2	
nalysis Batch: 30312	1				
Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Bato
680-96022-5	ESL-MW-D1-1113	Total/NA	Water	325.2	
LCS 680-303121/7	Lab Control Sample	Total/NA	Water	325,2	
MB 680-303121/42	Method Blank	Total/NA	Water	325.2	
nalysis Batch: 30326	1				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Bato
80-96022-2	ESL-MW-A-F(0.2)-1113	Dissolved	Water	415.1	
80-96022-4	ESL-MW-C1-F(0.2)-1113	Dissolved	Water	415.1	
880-96022-6	ESL-MW-D1-F(0.2)-1113	Dissolved	Water	415.1	
_CS 680-303261/5	Lab Control Sample	Dissolved	Water	415,1	
MB 680-303261/6	Method Blank	Dissolved	Water	415.1	
nalysis Batch: 30382	9				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Bate
680-96022-1	ESL-MW-A-1113	Total/NA	Water	415.1	
580-96022-3	ESL-MW-C1-1113	Total/NA	Water	415.1	
680-96022-5	ESL-MW-D1-1113	Total/NA	Water	415.1	
CS 680-303829/29	Lab Control Sample	Total/NA	Water	415.1	
MB 680-303829/26	Method Blank	Total/NA	Water	415.1	
nalysis Batch: 30385	5				
_ab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Bate
580-96022-1	ESL-MW-A-1113	Total/NA	Water	310.1	
80-96022-3	ESL-MW-C1-1113	Total/NA	Water	310.1	

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310.1

Water



Total/NA

# **QC Association Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-96022-1

SDG: KPS101

# General Chemistry (Continued)

Analysis Batch: 303855 (Continued)

Control of	Lab Sample ID	Client Sample ID	Prep Туре	Matrix	Method	Prep Batch
1	LCSD 680-303855/32	Lab Control Sample Dup	Total/NA	Water	310.1	***************************************
1	MB 680-303855/5	Method Blank	Total/NA	Water	310.1	

#### Lab Chronicle

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-96022-1

SDG: KPS101

Client Sample ID: ESL-MW-A-1113

Date Collected: 11/08/13 13:55 Date Received: 11/09/13 08:50 Lab Sample ID: 680-96022-1

Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Ргер Туре	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	304108	11/20/13 04:05	JD1	TAL SAV
Total/NA	Analysis	RSK-175		1	302929	11/13/13 11:36	AJMC	TAL SAV
Total Recoverable	Prep	3005A			302642	11/11/13 13:32	BJB	TAL SAV
Total Recoverable	Analysis	6010C		1	303006	11/13/13 00:41	BCB	TAL SAV
Total/NA	Analysis	353.2		1	302467	11/09/13 12:59	CRW	TAL SAV
Total/NA	Analysis	375.4		50	302727	11/11/13 16:31	JME	TAL SAV
Total/NA	Analysis	325.2		1	303120	11/13/13 13:35	JME	TAL SAV
Total/NA	Analysis	415.1		1	303829	11/16/13 22:05	CMP	TAL SAV
Total/NA	Analysis	310.1		1	303855	11/18/13 14:18	LBH	TAL SAV

Client Sample ID: ESL-MW-A-F(0.2)-1113

Date Collected: 11/08/13 13:55

Date Received: 11/09/13 08:50

Lab Sample ID: 680-96022-2

Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Ргер Туре	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	3005A		***************************************	302642	11/11/13 13:32	BJB	TAL SAV
Dissolved	Analysis	6010C	•	1	303006	11/13/13 00:45	BCB	TAL SAV
Dissolved	Analysis	415.1		1	303261	11/13/13 20:50	CMP	TAL SAV

Client Sample ID: ESL-MW-C1-1113

Date Collected: 11/08/13 10:25

Date Received: 11/09/13 08:50

_ab Sample ID: 680-960	22-3
------------------------	------

Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	304108	11/20/13 04:34	JD1	TAL SAV
Total/NA	Analysis	RSK-175		1	302929	11/13/13 11:49	AJMC	TAL SAV
Total Recoverable	Prep	3005A			302642	11/11/13 13:32	вјв	TAL SAV
Total Recoverable	Analysis	6010C		1	303006	11/13/13 00:50	BCB	TAL SAV
Total/NA	Analysis	353.2		, 1	302467	11/09/13 13:03	CRW	TAL SAV
Total/NA	Analysis	375.4		50	302727	11/11/13 16:29	JME	TAL SAV
Total/NA	Analysis	325.2		2	303120	11/13/13 15:04	JME	TAL SAV
Total/NA	Analysis	415.1		1	303829	11/16/13 22:21	CMP	TAL SAV
Total/NA	Analysis	310.1		1	303855	11/18/13 13:17	LBH	TAL SAV

Client Sample ID: ESL-MW-C1-F(0.2)-1113

Date Collected: 11/08/13 10:25

Date Received: 11/09/13 08:50

Lab Sample	ID: 680-96022-4
------------	-----------------

Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Ргер Туре	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	3005A	Exhade his sach as all shorter		302642	11/11/13 13:32	BJB	TAL SAV
Dissolved	Analysis	6010C		1	303006	11/13/13 01:04	BCB	TAŁ SAV

TestAmerica Savannah

C U 9 2013 M

#### Lab Chronicle

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-96022-1

SDG: KPS101

Client Sample ID: ESL-MW-C1-F(0.2)-1113

Date Collected: 11/08/13 10:25

Lab Sample ID: 680-96022-4

Matrix: Water

Date Received: 11/09/13 08:50

-		Batch	Batch		Dilution	Batch	Prepared		
44	Ргер Туре	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
-	Dissolved	Analysis	415.1		1	303261	11/13/13 21:10	CMP	TAL SAV

Lab Sample ID: 680-96022-5

Matrix: Water

Client Sample ID: ESL-MW-D1-1113

Date Collected: 11/08/13 12:10 Date Received: 11/09/13 08:50

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		25	304581	11/22/13 12:36	JD1	TAL SAV
Total/NA	Analysis	R\$K-175		1	302929	11/13/13 12:02	AJMC	TAL SAV
Total Recoverable	Prep	3005A			302642	11/11/13 13:32	BJB	TAL SAV
Total Recoverable	Analysis	6010C		1	303006	11/13/13 01:09	BCB	TAL SAV
Total/NA	Analysis	353.2		1	302467	11/09/13 13:04	CRW	TAL SAV
Total/NA	Analysis	375.4		50	302727	11/11/13 16:29	JME	TAL SAV
Total/NA	Analysis	325.2		2	303121	11/13/13 15:04	JME	TAL SAV
Total/NA	Analysis	415.1		1	303829	11/16/13 22:36	CMP	TAL SAV
Total/NA	Analysis	310,1		1	303855	11/18/13 13:24	LBH	TAL SAV

Client Sample ID: ESL-MW-D1-F(0.2)-1113

Date Collected: 11/08/13 12:10

Date Received: 11/09/13 08:50

Lab Sample ID: 680-96022-6

Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			302642	11/11/13 13:32	BJB	TAL SAV
Dissolved	Analysis	6010C		1	303006	11/13/13 01:13	BCB	TAL SAV
Dissolved	Analysis	415.1		1	303261	11/13/13 21:29	CMP	TAL SAV

Client Sample ID: 4Q13 LTM Trip Blank #5

Date Collected: 11/08/13 00:00

Date Received: 11/09/13 08:50

Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	304108	11/20/13 01:08	JD1	TAL SAV

Laboratory References:

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Chain of Custody Record

Savannah 5102 LaRoche Avenue

Sevennat, GA 31404 phone 912.354.7858 fax 912.352.0165			•	•	TestAmerica Laboratories, Inc.
Client Contact	Project Manager: Bob Billman	is.	Site Contact: Michael Corbett		COC No:
URS Corporation	Tel/Fax: (314) 743-4108	1	Lab Contact: Michele Kersey	Carrier: LecEX	/ of / COCs
1001 Highlands Plaza Drive West, Suite 300	Analysis Turnaround Time	d Тіте			Job No.
St Louis, MO 63110	Calendar ( C ) or Work Days (W)	(v)	f'SL		
(314) 429-0100 Phone	TAT if different from Below	Standord	ŞL		
(314) 429-0462 FAX	2 weeks		1315		SIXE No.
Project Name: 4Q13 LTM GW Sampling	1 week		NS/I		opmone to
Site: Solutia WG Krummich Facility	2 days		1101 1.01 2.25.2 d 803		
PO#	l day		Min 1 by 3 by 3 by 3 by 3 by 3 by 3 by 3 by 3		
Sample Identification	Sample Sample Sample Date Time Type	#of Matrix Cour.	Dissolved LOC by d Nitrate by Chloride Total For	DOC PÀ «	Sample Specific Notes:
ESL-MW-A-1113	0 93518/11	Water 12	3 1 1 1 3 2 1		
ESL-MW-A-F(0.2)-1113	o 55E) .	Water 2 X	7	yani	
ESL-MW-CI-1113	)  Se0	Water 12	3 1 1 1 3 2 1		
ESL-MW-C1-F(0.2)-1113	) (Sec)	Water 2 X	-		
EST-MW-DI-1113	120 c	Water 12	3 1 1 1 3 2 1		
ESTMW-DI-F(0.2)-1113	5 NEI 1	Water 2	X	1	Your above described and Anna Anna Anna Anna Anna Anna Anna
	9	Water 12	3 1 1 1 3 2 1		
	9	Water 2 3	x		
And the state of t					
- The second sec					
				CONSOLZ Chain of Custody	of Custody
4Q13 LTM Trip Blank # 6		Water 2	2		i de de la companione d
Preservation Used: 1 = Ice, 2 = HCl; 3 = H2SO4; 4=HNO3; 5=NaOH; 6= Other	JH; 6= Other		2 4 1 1 1 3,1 2 4	2 4 1 1 1 331 2 4 2	ned longer than 1 month)
Possible Hazard Identification  Non-Hazard [ Flammable Skin Irritant	ison B		Return To Client	Disposal By Lab	ive For Months
s/QC Requirements & Co			,		
Relinquished by:	Company: URS	Date/Time:	Received My	Company:	11/09/17 08;50
Relinquished by:	Сотрапу:	Date/Time:	Received by:	Company:	Date/Time:
Refinquished by:	Сотралу:	Date/Time:	Received by:	Сопрану:	Оате/Time:

22096-089

# Login Sample Receipt Checklist

Client: Solutia Inc.

Job Number: 680-96022-1

SDG Number: KPS101

List Source: TestAmerica Savannah

Login Number: 96022 List Number: 1

Creator: Contreras, Cesar A

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	,
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica Savannah

# **Certification Summary**

Client: Solutia Inc.

Project/Site: WGK Long Term Monitoring - 4Q13 NOV 2013

TestAmerica Job ID: 680-96022-1 SDG: KPS101

#### Laboratory: TestAmerica Savannah

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
	AFCEE	The best of the be	SAVLAB	
A2LA	DoD ELAP		399.01	02-28-15
A2LA	ISO/IEC 17025		399.01	02-28-15
Alabama	State Program	4	41450	06-30-14
Arkansas DEQ	State Program	6	88-0692	02-01-14
California	NELAP	9	3217CA	07-31-14
Colorado	State Program	8	N/A	12-31-13 *
Connecticut	State Program	1	PH-0161	03-31-15
Florida	NELAP	4	E87052	06-30-14
GA Dept. of Agriculture	State Program	4	N/A	12-31-13 *
Georgia	State Program	4	N/A	06-30-14
Georgia	State Program	4	803	06-30-14
Guam	State Program	9	09-005r	06-17-14
Hawaii	State Program	9	N/A	06-30-14
Illinois	NELAP	5	200022	11-30-13 *
Indiana	State Program	5	N/A	06-30-14
lowa	State Program	7	353	07-01-15
Kentucky	State Program	4	90084	12-31-13 *
Kentucky (UST)	State Program	4	18	06-30-14
_ouisiana	NELAP	6	30690	06-30-14
Maine	State Program	1	GA00006	08-16-14
Maryland	State Program	3	250	12-31-13 *
Massachusetts	State Prògram	1 ,	M-GA006	06-30-14
Michigan	State Program	5	9925	06-30-14
Mississippi	State Program	4	N/A	06-30-14
Montana	State Program	8	CERT0081	01-01-14 *
Vebraska	State Program	7	TestAmerica-Savannah	06-30-14
New Jersey	NELAP	2	GA769	06-30-14
New Mexico	State Program	6	N/A	06-30-14
New York	NELAP	2	10842	04-01-14
North Carolina DENR	State Program	4	269	12-31-13 *
North Carolina DHHS	State Program	4	13701	07-31-14
Oklahoma	State Program	6	9984	08-31-14
Pennsylvania	NELAP	3	68-00474	06-30-14
Puerto Rico	State Program	2	GA00006	01-01-14 *
South Carolina	State Program	4	98001	06-30-14
Tennessee	State Program	4	TN02961	06-30-14
Texas	NELAP	6	T104704185-08-TX	11-30-14
JSDA		•		
	Federal NELAP	9	SAV 3-04	04-07-14
/irginia Mashington		3	460161	06-14-14
Washington Wash Virginia	State Program	10	C1794	06-10-14
West Virginia	State Program	3	9950C	12-31-13 *
West Virginia DEP	State Program	3	94	06-30-14
Wisconsin	State Program	5	999819810	08-31-14
Wyoming	State Program	8	8TMS-L	06-30-14

<sup>\*</sup> Expired certification is currently pending renewal and is considered valid.

# Appendix E Microbial Insights Data Package



10515 Research Drive Knoxville, TN 37932 Phone: (865) 573-8188 Fax: (865) 573-8133 Email: info@microbe.com

Client: Nathan McNurlen Phone:

**URS Corp** 

1001 Highlands Plaza Dr. West

Suite 300

St. Louis, MO 63110 Fax:

Client Project #: 21562838.0009 Client Project Name: Solutia WGK 4Q13 GW

Purchase Order #: 294668

Eri Huchw Music

Analysis Requested: PLFA, Stable Isotope Probing, Standard Bio-Trap

#### Reviewed By:

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### MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932 Tel. (865) 573-8188 Fax. (865) 573-8133

**PLFA** 

Client: **URS Corp** 

Project: Solutia WGK 4Q13 GW MI Project Number: 096KJ Date Received: 10/31/2013

#### **Sample Information**

Sample Name:	BSA-MW-1S-11 13	BSA-MW2D-111 3	BSA-MW-3D- 1113	BSA-MW-4D-1 113	BSA-MW-5D-11 13	
Sample Date:	10/30/2013	10/30/2013	10/30/2013	10/30/2013	10/30/2013	
Sample Matrix:	Std. Bio-Trap	Adv. Bio-Trap	Std. Bio-Trap	Std. Bio-Trap	Std. Bio-Trap	
Analyst:	BJ	BJ	BJ	BJ	BJ	
Biomass Concentrations						
Total Biomass (cells/bead)	9.71E+04	9.00E+04	0.00E+00	0.00E+00	1.10E+05	
Community Structure (% total PLFA)						
Firmicutes (TerBrSats)	1.27	0.00	0.00	0.00	0.00	
Proteobacteria (Monos)	73.58	81.22	0.00	0.00	83.95	
Anaerobic metal reducers (BrMonos)	0.00	0.00	0.00	0.00	0.00	
SRB/Actinomycetes (MidBrSats)	0.00	0.00	0.00	0.00	0.00	
General (Nsats)	25.16	18.79	0.00	0.00	14.77	
Eukaryotes (polyenoics)	0.00 0.00		0.00	0.00	1.27	
Physiological Status (Proteobacteria o	nly)					
Slowed Growth	1.34	0.21	0.00	0.00	0.15	

0.00

0.00

0.00

0.00

1.94

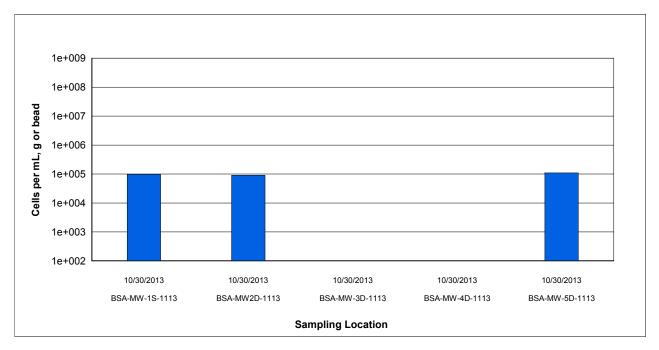
Legend:
NA = Not Analyzed NS = Not Sampled

**Decreased Permeability** 

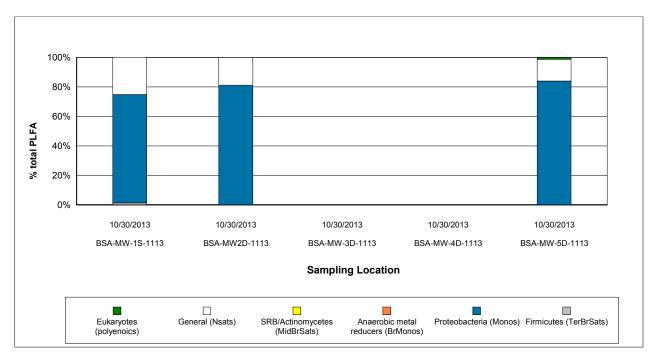
**PLFA** 

10515 Research Dr., Knoxville, TN 37932 Tel. (865) 573-8188 Fax. (865) 573-8133

Client:URS CorpMI Project Number:096KJProject:Solutia WGK 4Q13 GWDate Received:10/31/2013



**Figure 1.** Biomass content is presented as a cell equivalent based on the total amount of phospholipid fatty acids (PLFA) extracted from a given sample. Total biomass is calculated based upon PLFA attributed to bacterial and eukaryotic biomass



**Figure 2.** Relative percentages of total PLFA structural groups in the samples analyzed. Structural groups are assigned according to PLFA chemical structure, which is related to fatty acid biosynthesis.

### MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932 Tel. (865) 573-8188 Fax. (865) 573-8133

**PLFA** 

**URS Corp** Client:

Project: Solutia WGK 4Q13 GW MI Project Number: Date Received:

096KJ 10/31/2013

Sample Information

Sample Name:	CPA-MW-1D-11 13	CPA-MW-2D-111	CPA-MW3D- 1113	CPA-MW-4D-1 113	CPA-MW-5D-11 13
Sample Date:	10/30/2013	10/30/2013	10/30/2013	10/30/2013	10/30/2013
Sample Matrix:	Std. Bio-Trap	Std. Bio-Trap	Adv. Bio-Trap	Std. Bio-Trap	Std. Bio-Trap
Analyst:	BJ	BJ	BJ	BJ	BJ

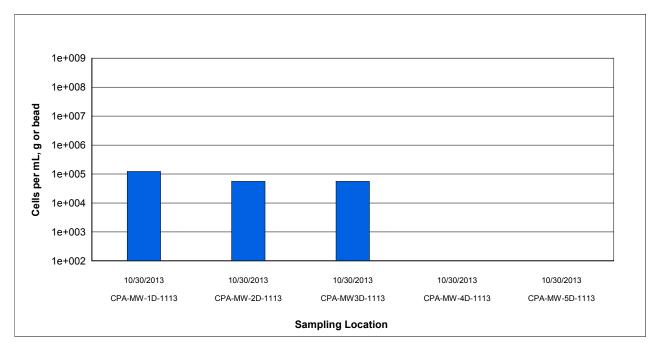
Total Biomass (cells/bead)	/bead) 1.22E+05 5.56E+04 5.60E+04 0.00E+00				
ommunity Structure (% total PLFA)					
Firmicutes (TerBrSats)	1.82	0.00	0.00	0.00	0.00
Proteobacteria (Monos)	37.45	64.51	70.38	0.00	0.00
Anaerobic metal reducers (BrMonos)	0.00	5.71	0.00	0.00	0.00
SRB/Actinomycetes (MidBrSats)	0.00	0.00	0.00	0.00	0.00
General (Nsats)	56.70	28.25	29.61	0.00	0.00
Eukaryotes (polyenoics)	4.03	1.53	0.00	0.00	0.00
nysiological Status (Proteobacteria o	nly)				
Slowed Growth	2.21	1.79	0.43	0.00	0.00
Decreased Permeability	0.00	0.00	0.00	0.00	0.00

Legend:
NA = Not Analyzed NS = Not Sampled

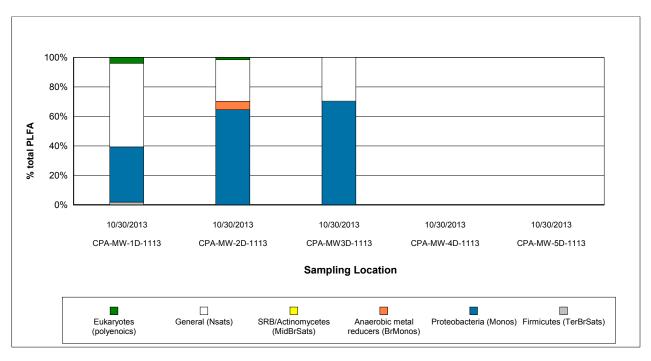
**PLFA** 

10515 Research Dr., Knoxville, TN 37932 Tel. (865) 573-8188 Fax. (865) 573-8133

Client:URS CorpMI Project Number:096KJProject:Solutia WGK 4Q13 GWDate Received:10/31/2013



**Figure 1.** Biomass content is presented as a cell equivalent based on the total amount of phospholipid fatty acids (PLFA) extracted from a given sample. Total biomass is calculated based upon PLFA attributed to bacterial and eukaryotic biomass



**Figure 2.** Relative percentages of total PLFA structural groups in the samples analyzed. Structural groups are assigned according to PLFA chemical structure, which is related to fatty acid biosynthesis.



10515 Research Drive Knoxville, TN 37932 Phone: (865) 573-8188 Fax: (865) 573-8133 Email: info@microbe.com

Client Project #: 21562838.0009 Client Project Name: Solutia WGK 4Q13 GW

Purchase Order #: 294668

Comments: Please note that the total biomass result for samples BSA-MW-3D, BSA-MW-4D,

CPA-MW-4D, and CPA-MW-5D fell below the method detection limit for the PLFA

analysis.





Web: www.microbe.com

# **SITE LOGIC Report**

Stable Isotope Probing (SIP) Study

Contact: Nathan McNurlen

Address: URS Corporation – St. Louis MO

1001 Highlands Plaza Drive West

Suite 300

St. Louis, MO 63110

Phone: (314) 429-0100

Email: nathan.mcnurlen@urs.com

**MI** Identifier: Report Date: 096KJ 12/12/2013

**Project:** Solutia WGK 4Q13 GW; # 21562838.0009

**Comments:** 

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# **Executive Summary**

A Stable Isotope Probing (SIP) study was performed to determine whether biodegradation of benzene and chlorobenzene is occurring under existing site conditions. Bio-Trap® samplers baited with <sup>13</sup>C labeled benzene and <sup>13</sup>C labeled chlorobenzene were deployed in monitoring wells BSA-MW-2D-1113 and CPA-MW-3D-1113, respectively. Following a deployment period, the Bio-Traps were recovered to quantify <sup>13</sup>C incorporation into biomass and dissolved inorganic carbon (DIC). A complete summary of the SIP results is provided in Table 1. Tables 2 and 3 contain summaries of PLFA analysis performed on standard Bio-Trap samplers deployed in select monitoring wells.

#### Stable Isotope Probing (SIP)

- Incorporation of <sup>13</sup>C into the biomass in wells BSA-MW-2D-1113 and CPA-MW-3D-1113 conclusively demonstrates that benzene and chlorobenzene biodegradation occurred under existing site conditions.
  - o Total PLFA biomass concentrations in both wells (9.00E+04 and 5.60E+04, respectively) were within the low range.
  - The average PLFA  $\delta^{13}$ C values of wells BSA-MW-2D-1113 and CPA-MW-3D-1113 were 1,730% and 1,362%, respectively.
  - o Average DIC  $\delta^{13}$ C value (25.8%) in well BSA-MW-2D conclusively shows that mineralization occurred in this well.
  - O However, average DIC  $\delta^{13}$ C value (-7.3‰) in well CPA-MW-3D indicates mineralization did not occur, at least during the deployment period.
  - The PLFA community structure in both wells was mostly comprised of monounsaturates, indicators of Proteobacteria. Normal saturates were also detected.

#### **PLFA Analysis - Standard Bio-Traps**

- Total biomass concentrations in the BSA wells fell within the low to moderate range (~10<sup>4</sup> to ~10<sup>5</sup> cells/bead). Total biomass in wells BSA-MW-3D and BSA-MW-4D fell below the method detection limit for the PLFA analysis.
  - Monounsaturates were the primary PLFA group in the BSA wells suggesting that microbial communities in these wells were mostly Proteobacteria.
- In the CPA wells total PLFA biomass concentrations also fell within the lower range (~10<sup>4</sup> cells/bead). Total biomass in wells CPA-MW-4D, and CPA-MW-5D fell below the method detection limit for the PLFA analysis.
  - o As seen in the BSA wells, monounsaturates were the primary PLFA group in all CPA wells.

Fax: 865.573.8133 www.microbe.com



# Overview of Approach

#### Stable Isotope Probing (SIP)

Stable isotope probing (SIP) is an innovative method to track the environmental fate of a "labeled" contaminant of concern to unambiguously demonstrate biodegradation. Two stable carbon isotopes exist in nature – carbon 12 (<sup>12</sup>C) which accounts for 99% of carbon and carbon 13 (<sup>13</sup>C) which is considerably less abundant (~1%). With the SIP method, the Bio-Trap® sampler is baited with a specially synthesized form of the contaminant containing <sup>13</sup>C labeled carbon. Since <sup>13</sup>C is rare, the labeled compound can be readily differentiated from the contaminants present at the site. Following deployment, the Bio-Trap® is recovered and three approaches are used to conclusively demonstrate biodegradation of the contaminant of concern.

- The loss of the labeled compound provides an estimate of the degradation rate (% loss of <sup>13</sup>C).
- Quantification of <sup>13</sup>C enriched phospholipid fatty acids (PLFA) indicates incorporation into microbial biomass.
- Quantification of <sup>13</sup>C enriched dissolved inorganic carbon (DIC) indicates contaminant mineralization.

#### Phospholipid Fatty Acids (PLFA)

PLFA are a primary component of the membrane of all living cells including bacteria. PLFA decomposes rapidly upon cell death (1, 2), so the total amount of PLFA present in a sample is indicative of the viable biomass. When combined with stable isotope probing (SIP), incorporation of <sup>13</sup>C into PLFA is a conclusive indicator of biodegradation.

Some organisms produce "signature" types of PLFA allowing quantification of important microbial functional groups (e.g. iron reducers, sulfate reducers, or fermenters). The relative proportions of the groups of PLFA provide a "fingerprint" of the microbial community. In addition, *Proteobacteria* modify specific PLFA during periods of slow growth or in response to environmental stress providing an index of their health and metabolic activity.

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# Results

Table 1. Summary of the results obtained from the Bio-Trap® Units. Interpretation guidelines and definitions are found later in the document

Sample Name	BSA-MW-2D-1113	CPA-MW-3D-1113
<sup>13</sup> C Contaminant Loss		
<sup>13</sup> C Benzene Pre-deployment (μg/bead)	102 ± 11	
<sup>13</sup> C Benzene Post-deployment (μg/bead)	82 ± 12	
<sup>13</sup> C Chlorobenzene Pre-deployment (μg/bead)		126 ± 11
<sup>13</sup> C Chlorobenzene Post-deployment (μg/bead)		51 ± 8
Biomass & <sup>13</sup> C Incorporation		
Total Biomass (Cells/bead)	9.00E+04	5.60E+04
<sup>13</sup> C Enriched Biomass (Cells/bead)	2.45E+03	9.95E+02
Average PLFA Del (‰)	1,730	1,362
Maximum PLFA Del (‰)	2,085	1,849
<sup>13</sup> C Mineralization		
DIC Del (%)	25.8	-7.3
% 13C	1.13	1.10
Community Structure (% total PLFA)		
Firmicutes (TerBrSats)	0.0	0.0
Proteobacteria (Monos)	81.2	70.4
Anaerobic metal reducers (BrMonos)	0.0	0.0
Actinomycetes (MidBrSats)	0	0
General (Nsats)	18.8	29.6
Eukaryotes (Polyenoics)	0.0	0.0
Physiological Status (Proteobacteria only)		
Slowed Growth	0.21	0.43
Decreased Permeability	0.00	0.00



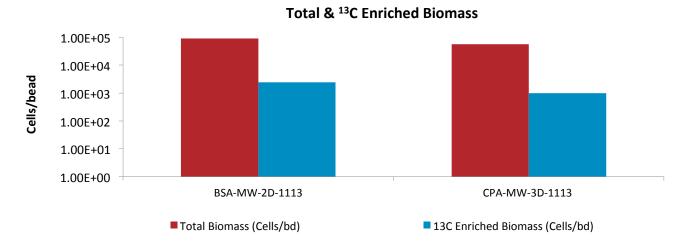
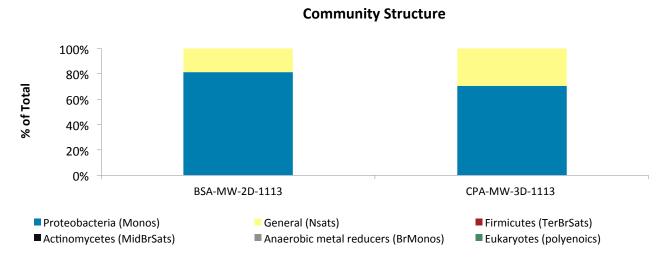


Figure 1. Biomass content is presented as a cell equivalent based on the total amount of phospholipid fatty acids (PLFA) extracted from a given sample. Total biomass is calculated based upon PLFA attributed to bacterial and eukaryotic biomass (associated with higher organisms).



**Figure 2.** Relative percentages of total PLFA structural groups in the samples analyzed. Structural groups are assigned according to PLFA chemical structure, which is related to fatty acid biosynthesis. See the table in the interpretation section for detailed descriptions of the structural groups.



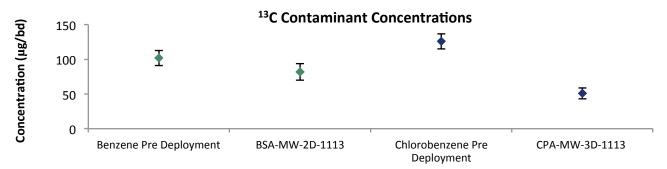
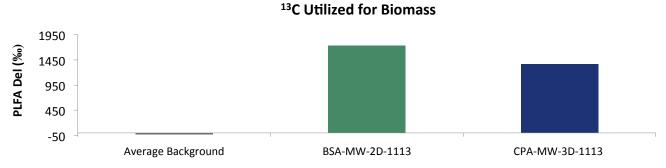
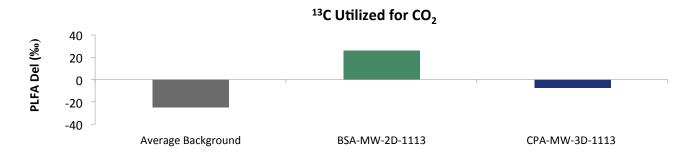


Figure 3. Comparison of Pre-deployment concentrations loaded on Bio-Sep beads to the concentrations detected after incubation.



**Figure 4.** Comparison of the average Del value obtained from PLFA biomarkers from each Bio-Trap® unit to the average background Del observed in samples not exposed to <sup>13</sup>C enriched compounds.



**Figure 5.** Comparison of the Del value obtained from DIC from each Bio-Trap® unit to the average background Del observed in samples not exposed to <sup>13</sup>C enriched compounds.

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Table 2. Summary of the PLFA results for the benzene wells obtained from the Bio-Trap® Units.

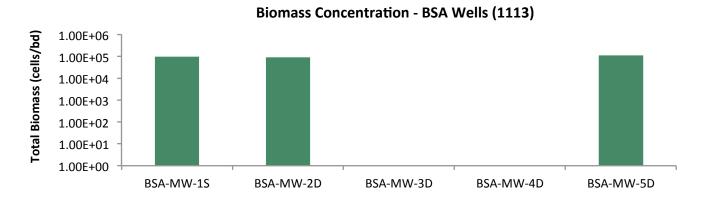
Sample Name	BSA-MW-1S- B: 1113		BSA-MW-3D- 1113	BSA-MW-4D- 1113	BSA-MW-5D- 1113
Biomass Concentration					
Total Biomass (Cells/bead)	9.71E+04	9.00E+04	<1.65E+04	<1.66E+04	1.10E+05
Community Structure (% total PLFA)					
Firmicutes (TerBrSats)	1.3	0			0
Proteobacteria (Monos)	73.6	81.2			84.0
Anaerobic metal reducers (BrMonos)	0	0			0
Actinomycetes (MidBrSats)	0	0			0
General (Nsats)	25.2	18.8			14.8
Eukaryotes (Polyenoics)	0	0			1.3
Physiological Status (Proteobacteria only)					
Slowed Growth	1.34	0.21			0.15
Decreased Permeability	1.94	0.00			0.00

Table 3. Summary of the PLFA results for the chlorobenzene wells obtained from the Bio-Trap® Units.

Sample Name	CPA-MW-1D- CPA-MW-2D- 1113 1113		CPA-MW-3D- 1113	CPA-MW-4D- 1113	CPA-MW-5D- 1113
Biomass Concentration					
Total Biomass (Cells/bead)	1.22E+05	5.56E+04	5.60E+04	<1.68E+04	<1.67E+04
Community Structure (% total PLFA)					
Firmicutes (TerBrSats)	1.8	0	0		
Proteobacteria (Monos)	37.5	64.5	70.4		
Anaerobic metal reducers (BrMonos)	0	5.7	0		
Actinomycetes (MidBrSats)	0	0	0		
General (Nsats)	56.7	28.3	29.6		
Eukaryotes (Polyenoics)	4.0	1.5	0		
Physiological Status (Proteobacteria only)					
Slowed Growth	2.21	1.79	0.43		
Decreased Permeability	0.00	0.00	0.00		

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**Figure 6.** Biomass content is presented as a cell equivalent based on the total amount of phospholipid fatty acids (PLFA) extracted from a given sample. Total biomass is calculated based upon PLFA attributed to bacterial and eukaryotic biomass (associated with higher organisms).

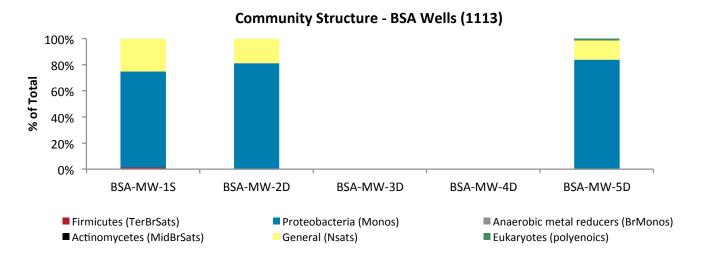


Figure 7. Relative percentages of total PLFA structural groups in the samples analyzed. Structural groups are assigned according to PLFA chemical structure, which is related to fatty acid biosynthesis. See the table in the interpretation section for detailed descriptions of the structural groups.





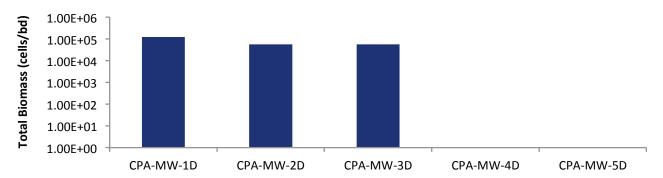
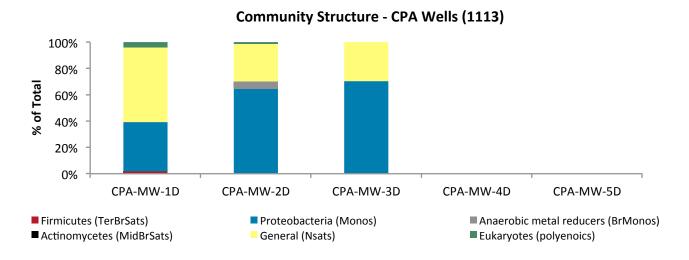


Figure 8. Biomass content is presented as a cell equivalent based on the total amount of phospholipid fatty acids (PLFA) extracted from a given sample. Total biomass is calculated based upon PLFA attributed to bacterial and eukaryotic biomass (associated with higher organisms).



**Figure 9.** Relative percentages of total PLFA structural groups in the samples analyzed. Structural groups are assigned according to PLFA chemical structure, which is related to fatty acid biosynthesis. See the table in the interpretation section for detailed descriptions of the structural groups.



# Interpretation

Interpretation of the results of the SIP Bio-Trap® study must be performed with due consideration of site conditions, site activities, and the desired treatment mechanism. The following discussion describes interpretation of results in general terms and is meant to serve as a guide.

Contaminant Concentration: Bio-Traps® are baited with a <sup>13</sup>C labeled contaminant of concern and a pre-deployment concentration is determined prior to shipping. Following deployment, Bio-Traps® are recovered for analysis including measurement of the concentration of the <sup>13</sup>C labeled contaminant remaining. Pre- and post-deployment concentrations are used to calculate percent loss.

Biomass Concentrations: PLFA analysis is one of the most reliable and accurate methods available for the determination of viable (live) biomass. Phospholipids break down rapidly upon cell death, so biomass calculations based on PLFA content do not include "fossil" lipids from dead cells. Total biomass (cells/bead) is calculated from total PLFA using a conversion factor of 20,000 cells/pmole of PLFA. When making comparisons between wells, treatments, or over time, differences of one order of magnitude or more are considered significant.

	Total Biomass	
Low	Moderate	High
10 <sup>3</sup> to 10 <sup>4</sup> cells	$10^5$ to $10^6$ cells	10 <sup>7</sup> to 10 <sup>8</sup> cells

For SIP studies, the <sup>13</sup>C enriched PLFA is also determined to conclusively demonstrate contaminant biodegradation and quantify incorporation into biomass as a result of the <sup>13</sup>C being used for cellular growth. The % <sup>13</sup>C incorporation (<sup>13</sup>C enriched biomass/total biomass) is also provided in the data summary table, but the value must be interpreted carefully especially when comparing wells or treatments. Typically, biodegradation of a contaminant of concern is performed by a small subset of the total microbial community. For Bio-Traps® with large total biomass, the % <sup>13</sup>C incorporation value could be low despite significant <sup>13</sup>C labeled biomass and loss of the compound. The % <sup>13</sup>C incorporation should be viewed in light of total biomass, percent loss, and dissolved inorganic carbon (DIC) results.

 $^{13}$ C enrichment data is often reported as a del value. The del value is the difference between the isotopic ratio ( $^{13}$ C/ $^{12}$ C) of the sample (R<sub>x</sub>) and a standard (R<sub>std</sub>) normalized to the isotopic ratio of the standard (R<sub>std</sub>) and multiplied by 1,000 (units are parts per thousand, denoted ‰).

 $R_{std}$  is the naturally occurring isotopic ratio and is approximately 0.011180 (roughly 1% of naturally occurring carbon is  $^{13}$ C). The isotopic ratio,  $R_x$ , of PLFA is typically less than the  $R_{std}$  under natural conditions, resulting in a del value between -20 and -30‰. For a SIP Bio-Trap® study, biodegradation and incorporation of the  $^{13}$ C labeled compound into PLFA results in a larger  $^{13}$ C/ $^{12}$ C ratio ( $R_x$ ) and thus del values greater than under natural conditions. Typical PLFA del values are provided below.

	PLFA Del (‰)	
Low	Moderate	High
0 to 100	100 to 1,000	>1,000

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Dissolved Inorganic Carbon (DIC): Often, bacteria can utilize the <sup>13</sup>C labeled compound as both a carbon and energy source. The <sup>13</sup>C portion used as a carbon source for growth can be incorporated into PLFA as discussed above, while the <sup>13</sup>C used for energy is oxidized to <sup>13</sup>CO<sub>2</sub> (mineralized).

 $^{13}$ C enriched CO<sub>2</sub> data is often reported as a del value as described above for PLFA. Under natural conditions, the R<sub>x</sub> of CO<sub>2</sub> is approximately the same as R<sub>std</sub> (0.01118 or about 1.1%  $^{13}$ C). For an SIP Bio-Trap® study, mineralization of the  $^{13}$ C labeled contaminant of concern would lead to a greater value of R<sub>x</sub> (increased  $^{13}$ CO<sub>2</sub> production) and thus a positive del value. As with PLFA, del values between 0 and 100% are considered low, values between 100 and 1,000% are considered moderate, and values greater than 1,000% are considered high. Thus DIC  $^{13}$ C are considered low if the value is less than 1.23%, moderate if between 1.23 and 2.24%, and high if greater than 2.24%.

Dissolve	ed Inorganic Carbon (DIC) Del an	d % <sup>13</sup> C
Low	Moderate	High
0 to 100	100 to 1,000	>1,000
1.11 to 1.23%	1.23 to 2.24%	>2.24%

Community Structure (% total PLFA): Community structure data is presented as a percentage of PLFA structural groups normalized to the total PLFA biomass. The relative proportions of the PLFA structural groups provide a "fingerprint" of the types of microbial groups (e.g. anaerobes, sulfate reducers, etc.) present and therefore offer insight into the dominant metabolic processes occurring at the sample location. Thorough interpretation of the PLFA structural groups depends in part on an understanding of site conditions and the desired microbial biodegradation pathways. For example, an increase in mid chain branched saturated PLFA (MidBrSats), indicative of sulfate reducing bacteria (SRB) and *Actinomycetes*, may be desirable at a site where anaerobic BTEX biodegradation is the treatment mechanism, but would not be desirable for a corrective action promoting aerobic BTEX or MTBE biodegradation. The following table provides a brief summary of each PLFA structural group and its potential relevance to bioremediation.

Table 2. Description of PLFA structural groups.

PLFA Structural Group	General classification	Potential Relevance to Bioremediation Studies
Monoenoic (Monos)	Abundant in Proteobacteria (Gram negative bacteria), typically fast growing, utilize many carbon sources, and adapt quickly to a variety of environments.	Proteobacteria is one of the largest groups of bacteria and represents a wide variety of both aerobes and anaerobes. The majority of Hydrocarbon utilizing bacteria fall within the Proteobacteria
Terminally Branched Saturated (TerBrSats)	Characteristic of Firmicutes (Low G+C Gram-positive bacteria), and also found in Bacteriodes, and some Gram-negative bacteria (especially anaerobes).	Firmicutes are indicative of presence of anaerobic fermenting bacteria (mainly $Clostridia/Bacteriodes$ -like), which produce the $H_2$ necessary for reductive dechlorination
Branched Monoenoic (BrMonos)	Found in the cell membranes of micro-aerophiles and anaerobes, such as sulfate- or iron-reducing bacteria	In contaminated environments high proportions are often associated with anaerobic sulfate and iron reducing bacteria
Mid-Chain Branched Saturated (MidBrSats)	Common in sulfate reducing bacteria and also Actinobacteria (High G+C Gram-positive bacteria).	In contaminated environments high proportions are often associated with anaerobic sulfate and iron reducing bacteria
Normal Saturated (Nsats)	Found in all organisms.	High proportions often indicate less diverse populations.
Polyenoic	Found in higher plants, and animals.	Eukaryotic scavengers will often prey on contaminant utilizing bacteria.

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Physiological Status (*Proteobacteria*): Some *Proteobacteria* modify specific PLFA as a strategy to adapt to stressful environmental conditions (3, 4). For example, *cis* monounsaturated fatty acids may be modified to cyclopropyl fatty acids during periods of slowed growth or modified to *trans* monounsaturated fatty acids to decrease membrane permeability in response to environmental stress. The ratio of product to substrate fatty acid thus provides an index of their health and metabolic activity. In general, status ratios greater than 0.25 indicate a response to unfavorable environmental conditions.

# Glossary

Del: A Del value is the difference between the isotopic ratio ( $^{13}$ C/ $^{12}$ C) of the sample (R<sub>x</sub>) and a standard (R<sub>std</sub>) normalized to the isotopic ratio of the standard (R<sub>std</sub>) and multiplied by 1,000 (units are parts per thousand denoted ‰).

 $Del = (R_x - R_{std}) / R_{std} \times 1000$ 

### References

- 1. White, D.C., W.M. Davis, J.S. Nickels, J.D. King, and R.J. Bobbie. 1979. Determination of the sedimentary microbial biomass by extractable lipid phosphate. Oecologia 40:51-62.
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- 3. Guckert, J.B., M.A. Hood, and D.C. White. 1986. Phospholipid ester-linked fatty acid profile changes during nutrient deprivation of *Vibrio chloerae*: increases in the trans/cis ratio and proportions of cyclopropyl fatty acids. Applied and Environmental Microbiology. 52:794-801.
- 4. Tsitko, I.V., G. M. Zaitsev, A. G. Lobanok, and M.S. Salkinoja-Salonen. 1999. Effect of aromatic compounds on cellular fatty acid composition of *Rhodococcus opacus*. Applied and Environmental Microbiology. 65:853-855.

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Project Manager:	Bob Billman	Purchase Order No.	☐ More samples to follow
Project Name: Project No.:	Solutia WGK 4013 GW	Subcontract No.	No Additional Samples
			Saturday Delivery
Report Type:	⊠ Standard (default)	e) ☐ Historical (30% surcharge)	Please see sampling protocol for instructions

Please contact us prior to submitting samples regarding questions about the analyses you are requesting at (865) 573-8188 (8:00 am to 4:00 pm M-F). After these hours please call (865) 300-8053.

	Sample Informat	tion				SIP /	nalysi	S																			
MIID (Laboratory Use Only)	Sample Name	Date Sampled	Time Sampled	Matrix	PLFA	SIP-Benzene	SIP-Chlorobenzene																			ther:	Other:
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In order for analysis to be completed correctly, it is vital that chain of custody is filled out correctly & that all relative information is provided. Failure to provide sufficient and/or correct information regarding reporting, invoicing & analyses requested information may result in delays for which MI will not be liable. \* additional cost and sample preservation are associated with RNA samples.